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REPORT

OF THE

SIXTEENTH ANNUAL MEETING

OF THE

American Street Railway Association

HELD IN

CONVENTION HALL, NIAGARA FALLS,
OCTOBER 19-22, 1897.

MR. ROBERT McCULLOCH,

Vice-President and General Manager, Citizens', Cass Avenue and St. Louis Railroad Companies, St. Louis, Mo.,

PRESIDENT.

Association Organized December 13th, 1882

1897-1898

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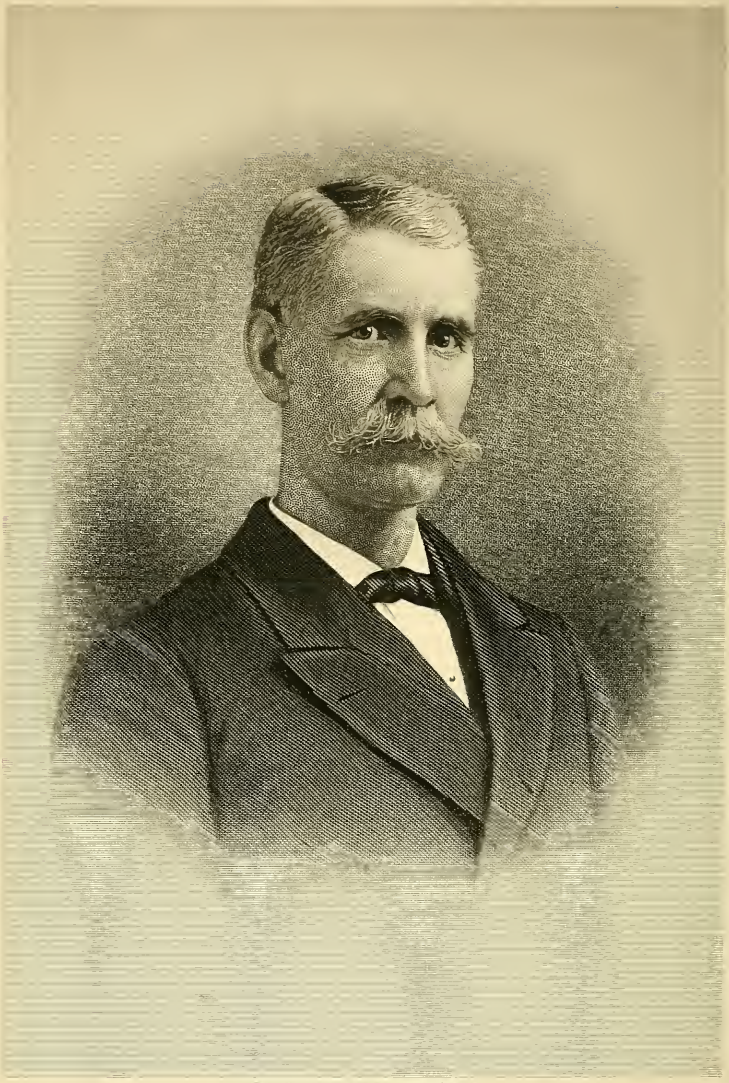

Robt. McCulloch

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OFFICERS, 1897–'98.

PRESIDENT:

ALBION E. LANG,

President Toledo Traction Company,
Toledo, Ohio.

FIRST VICE-PRESIDENT:

W. CARYL ELY,

President Buffalo and Niagara Falls
Electric Railway Company,
Niagara Falls, N. Y.

SECOND VICE-PRESIDENT:

JOHN A. RIGG,

President United Traction Company,
Reading, Pa.

THIRD VICE-PRESIDENT:

EDWARD G. CONNETTE,

General Manager Nashville Street Railway,
Nashville, Tenn.

SECRETARY AND TREASURER:

T. C. PENINGTON,

Treasurer Chicago City Railway Company,
Chicago, Ill.

EXECUTIVE COMMITTEE:

President, Vice Presidents and

Robert McCulloch, Vice-Pres. and Gen. Man. Citizens', Cass Avenue and St. Louis Railroad Companies, St. Louis, Mo.

C. Densmore Wyman, Gen. Man. New Orleans Traction Co., Ltd., New Orleans, La.

Henry C. Moore, Pres. Trenton Passenger Railway Co., Consolidated, Trenton, N. J.

John M. Roach, Vice-Pres. and Gen. Man. North Chicago Street Railroad Co., Chicago, Ill.

Robert S. Goff, Pres. and Gen. Man. Globe Street Railway Co., Fall River, Mass.

PLACE OF MEETING, BOSTON, MASS.

OFFICERS, ORGANIZATION.

CHAIRMAN:

MOODY MERRILL,

President, Highland Street Railway Company, Boston, Mass.

SECRETARIES:

CHAUNCEY C. WOODWORTH,

Secretary, Rochester City and Brighton Railroad Company, Rochester, N. Y.

CHARLES B. CLEGG,

President, Oakwood and Dayton Street Railway Companies, Dayton, O.

PLACE OF MEETING, BOSTON, MASS.

OFFICERS SINCE ORGANIZATION.

OFFICERS, 1882-'83.

PRESIDENT:

H. H. LITTELL,

General Manager, Louisville City Railway Company, Louisville, Ky.

FIRST VICE-PRESIDENT:

WILLIAM H. HAZZARD,

President, Brooklyn City Railroad Company, Brooklyn, N. Y.

SECOND VICE-PRESIDENT:

CALVIN A. RICHARDS,

President, Metropolitan Railroad Company, Boston, Mass.

THIRD VICE-PRESIDENT:

GEORGE B. KERPER,

President, Mount Adams and Eden Park Inclined Railway, Cincinnati, O.

SECRETARY AND TREASURER:

WILLIAM J. RICHARDSON,

Secretary, Atlantic Avenue Railroad Company, Brooklyn, N. Y.

EXECUTIVE COMMITTEE:

PRESIDENT, VICE-PRESIDENTS and
JULIUS S. WALSH, Pres., Citizens' Railway Co., St. Louis, Mo.
CHARLES CLEMINSHAW, Vice-Pres., Troy and Lansingburgh Railroad Co., Troy, N. Y.
THOMAS LOWRY, Pres., Minneapolis Street Railway Co., Minneapolis, Minn.
JAMES K. LAKE, Supt., Chicago West Division Railway, Chicago, Ill.
DANIEL F. LONGSTREET, Gen. Man., Union Railroad Co., Providence, R. I.

PLACE OF MEETING, CHICAGO, ILL.

OFFICERS, 1883-'84.

PRESIDENT:

WILLIAM H. HAZZARD,

President, Brooklyn City Railroad Company, Brooklyn, N. Y.

FIRST VICE-PRESIDENT:

JAMES K. LAKE,

Superintendent, Chicago West Division Railway, Chicago, Ill.

SECOND VICE-PRESIDENT:

GEORGE B. KERPER,

President, Mt. Adams and Eden Park Inclined Railway, Cincinnati, O.

THIRD VICE-PRESIDENT:

DANIEL F. LONGSTREET,

General Manager, Union Railroad Co., Providence, R. I.

SECRETARY AND TREASURER:

WILLIAM J. RICHARDSON,

Secretary, Atlantic Avenue Railroad Company, Brooklyn, N. Y.

EXECUTIVE COMMITTEE:

PRESIDENT, VICE-PRESIDENTS and
H. H. LITTELL, Gen. Man., Louisville City Railway Co., Louisville, Ky.
JOHN G. HOLMES, Pres., Citizens' Street Railroad Co., Pittsburgh, Pa.
JULIUS E. RUGG, Supt., Highland Street Railroad, Boston, Mass.
PIERRE C. MAFFITT, Pres., Missouri Railroad Co., St. Louis, Mo.
JACOB SHARP, Pres., Twenty-third Street Railway Co., New York, N. Y.

PLACE OF MEETING, NEW YORK, N. Y.

OFFICERS, 1884-'85.

PRESIDENT:

CALVIN A. RICHARDS,

President, Metropolitan Railroad Company, Boston, Mass.

FIRST VICE-PRESIDENT:

JULIUS S. WALSH,

President, Citizens' Railway Company, St. Louis, Mo.

SECOND VICE-PRESIDENT:

HENRY M. WATSON,

President, Buffalo Street Railroad Company, Buffalo, N. Y.

THIRD VICE-PRESIDENT:

EDWARD LUSHER,

Sec. and Treas., Montreal City Passenger Railway Company, Montreal, Can.

SECRETARY AND TREASURER:

WILLIAM J. RICHARDSON,

Secretary, Atlantic Avenue Railroad Company, Brooklyn, N. Y.

EXECUTIVE COMMITTEE:

PRESIDENT, VICE-PRESIDENTS and
WILLIAM H. HAZZARD, Pres., Brooklyn City Railroad Co., Brooklyn, N. Y.
JAMES K. LAKE, Supt., Chicago West Division Railway, Chicago, Ill.
CHARLES J. HARRAH, Pres., People's Passenger Railway Co., Philadelphia, Pa.
WILLIAM WHITE, Pres., Dry Dock, E. Broadway & B. Railroad Co., New York, N. Y
B. DU PONT, Pres., Central Passenger Railroad Co., Louisville, Ky.

PLACE OF MEETING, ST. LOUIS, MO.

OFFICERS, 1885-'86.

PRESIDENT:

JULIUS S. WALSH,

President, Citizens' Railway Company, St. Louis, Mo.

FIRST VICE-PRESIDENT:

WILLIAM WHITE,

President, Dry Dock, E. Broadway & B. Railroad Company, New York, N. Y.

SECOND VICE-PRESIDENT:

CHARLES B. HOLMES,

President, Chicago City Railway Company, Chicago, Ill.

THIRD VICE-PRESIDENT:

SAMUEL LITTLE,

Treasurer, Highland Street Railway Company, Boston, Mass.

SECRETARY AND TREASURER:

WILLIAM J. RICHARDSON,

Secretary, Atlantic Avenue Railroad Company, Brooklyn, N. Y.

EXECUTIVE COMMITTEE:

PRESIDENT, VICE-PRESIDENTS and
CALVIN A. RICHARDS, Pres., Metropolitan Railroad Co., Boston, Mass.
JOHN KILGOUR, Pres., Cincinnati Street Railway Co., Cincinnati, O.
JOHN MAGUIRE, Pres., City Railroad Co., Mobile, Ala.
THOMAS W. ACKLEY, Pres., 13th and 15th Streets Pass. Railway Co., Philadelphia, Pa.
CHAUNCEY C. WOODWORTH, Sec., Rochester City & B. Railroad Co., Rochester, N. Y.

PLACE OF MEETING, CINCINNATI, O.

OFFICERS, 1886-'87.

PRESIDENT:

THOMAS W. ACKLEY,

President, 13th and 15th Streets Passenger Railway Company, Philadelphia, Pa.

FIRST VICE-PRESIDENT:

ALBERT G. CLARK,

Vice-President, Cincinnati Street Railway Company, Cincinnati, O.

SECOND VICE-PRESIDENT:

WILLIAM H. SINCLAIR,

President, Galveston City Railroad Company, Galveston, Tex.

THIRD VICE-PRESIDENT:

PRENTISS CUMMINGS,

President, Cambridge Railroad Company, Cambridge, Mass.

SECRETARY AND TREASURER:

WILLIAM J. RICHARDSON,

Secretary, Atlantic Avenue Railroad Company, Brooklyn, N. Y.

EXECUTIVE COMMITTEE:

PRESIDENT, VICE-PRESIDENTS and
JULIUS S. WALSH, Pres., Citizens' Railway Co., St. Louis, Mo.
HENRY HURT, Pres., Washington and Georgetown Railroad Co., Washington, D. C.
C. DENSMORE WYMAN, Vice-Pres., Central Park, N. & E. River Railroad Co., N. Y.
A. EVERETT, Pres., East Cleveland Railroad Co., Cleveland, O.
SAMUEL S. SPAULDING, Pres., East Side Street Railroad Co., Buffalo, N. Y.

PLACE OF MEETING, PHILADELPHIA, PA.

OFFICERS, 1887-'88.

PRESIDENT:

CHARLES B. HOLMES,

President, Chicago City Railway Company, Chicago, Ill.

FIRST VICE-PRESIDENT:

JULIUS E. RUGG,

General Superintendent, Boston Consolidated Street Railway, Boston, Mass.

SECOND VICE-PRESIDENT:

R. DUDLEY FRAYSER,

President, Memphis City Railway Company, Memphis, Tenn.

THIRD VICE-PRESIDENT:

CHARLES B. CLEGG,

Director, Dayton Street Railroad Company, Dayton, O.

SECRETARY AND TREASURER:

WILLIAM J. RICHARDSON,

Secretary, Atlantic Avenue Railroad Company, Brooklyn, N. Y.

EXECUTIVE COMMITTEE:

PRESIDENT, VICE-PRESIDENTS and
THOMAS W. ACKLEY, Pres., 13th and 15th Streets Pass. Railway Co., Philadelphia, Pa.
WINFIELD SMITH, Pres., Cream City Railroad Co., Milwaukee, Wis.
DANIEL F. LEWIS, Pres., Brooklyn City Railroad Co., Brooklyn, N. Y.
CHARLES GREEN, Pres., People's Railway Co., St. Louis, Mo.
EDWARD G. MOSHER, Supt., Augusta and Summerville Railroad, Augusta, Ga.

PLACE OF MEETING, WASHINGTON, D. C.

OFFICERS, 1888-'89.

PRESIDENT:

GEORGE B. KERPER,

President, Mount Adams and Eden Park Inclined Railway, Cincinnati, O.

FIRST VICE-PRESIDENT:

JESSE METCALF,

President, Union Railroad Company, Providence, R. I.

SECOND VICE-PRESIDENT:

HENRY HURT,

President, Washington and Georgetown Railroad Company, Washington, D. C.

THIRD VICE-PRESIDENT:

WILLIAM H. MARTIN,

Vice-President, Ferries and Cliff House Railway Company, San Francisco, Cal.

SECRETARY AND TREASURER:

WILLIAM J. RICHARDSON,

Secretary, Atlantic Avenue Railroad Company, Brooklyn, N. Y.

EXECUTIVE COMMITTEE:

PRESIDENT, VICE-PRESIDENTS and
CHARLES B. HOLMES, Pres., Chicago City Railway Co., Chicago, Ill.
JOHN SCULLIN, Pres., Union Depot Railroad Co., St. Louis, Mo.
JAMES H. JOHNSTON, Pres., City and Suburban Railway Co., Savannah, Ga.
HENRY A. SAGE, Pres., Easton, S. Easton & W. E. Pass. Railway Co., Easton, Pa.
EDWARD J. LAWLESS, Supt., Metropolitan Street Railway, Kansas City, Mo.

PLACE OF MEETING, MINNEAPOLIS, MINN.

OFFICERS, 1889-'90.

PRESIDENT:

THOMAS LOWRY,

President, Minneapolis, and St. Paul, Street Railway Companies, Minneapolis, Minn.

FIRST VICE-PRESIDENT:

C. DENSMORE WYMAN,

Vice-President, Central Park, North and East River Railroad Company, New York, N. Y.

SECOND VICE-PRESIDENT:

JOHN C. SHAFFER,

President, Citizens' Street Railroad Company, Indianapolis, Ind.

THIRD VICE-PRESIDENT:

ROBERT McCULLOCH,

General Manager, Citizens', St. Louis, Cass Avenue & Fair Grounds, and Benton-Bellefontaine Railways, St. Louis, Mo.

SECRETARY AND TREASURER:

WILLIAM J. RICHARDSON,

Secretary, Atlantic Avenue Railroad Company, Brooklyn, N. Y.

EXECUTIVE COMMITTEE:

PRESIDENT, VICE-PRESIDENTS and
GEORGE B. KERPER, Pres., Mt. Adams and E. P. Inc. Railway Co., Cincinnati, O.
GEORGE W. KIELY, Man. Dir., Toronto Street Railway Co., Toronto, Canada.
FRANK H. MONKS, Gen. Man., West End Street Railway Co., Boston, Mass.
RAPHAEL SEMMES, Supt., Citizens' Street Railroad, Memphis, Tenn.
FRANCIS M. EPPLEY, Pres., Orange Cross-Town & B. Railway Co., Orange, N. J.

PLACE OF MEETING, BUFFALO, N. Y.

OFFICERS, 1890–'91.

PRESIDENT:

HENRY M. WATSON,

President, Buffalo Street Railroad, and Buffalo East Side Street Railway, Companies, Buffalo, N. Y.

FIRST VICE-PRESIDENT:

WILLIAM A. SMITH,

General Manager, Omaha Street Railway Company, Omaha, Neb.

THIRD VICE-PRESIDENT:

ANDREW D. RODGERS,

President, Columbus Consolidated Street Railroad Company, Columbus, O.

SECOND VICE-PRESIDENT:

CHARLES ODELL,

President, Newburyport & Amesbury Street Railroad Company, Newburyport, Mass.

SECRETARY AND TREASURER:

WM. J. RICHARDSON,

Secretary, Atlantic Avenue Railroad Company, Brooklyn, N. Y.

EXECUTIVE COMMITTEE:

PRESIDENT, VICE-PRESIDENTS and
THOMAS LOWRY, Pres., Minneapolis and St. Paul Street R'y Co's., Minneapolis, Minn.
DAVID F. HENRY, Pres., Federal Street and P. V. Pass. Railway Co., Pittsburg, Pa.
ALBERT E. THORNTON, Dir., Atlanta Street Railroad Co., Atlanta, Ga.
HARVEY M. LITTELL, Gen. Man., Cincinnati Inclined Plane R'y Co., Cincinnati, O.
THOMAS C. KEEFER, Pres., Ottawa City Pass. Railway Co., Ottawa, Canada.

PLACE OF MEETING, PITTSBURG, PA.

OFFICERS, 1891-'92.

PRESIDENT:

JOHN G. HOLMES,

President, Citizens' Traction Company, Pittsburgh, Pa.

FIRST VICE-PRESIDENT:

THOMAS H. McLEAN,

Secretary, Twenty-third Street Railway Company, New York, N. Y.

SECOND VICE-PRESIDENT:

JAMES B. SPEED,

President, Louisville City Railway Company, Louisville, Ky.

THIRD VICE-PRESIDENT:

ALBION E. LANG,

Vice-President, Toledo Consolidated Street Railway Company, Toledo, O.

SECRETARY AND TREASURER:

WM. J. RICHARDSON,

Secretary, Atlantic Avenue Railroad Company, Brooklyn, N. Y.

EXECUTIVE COMMITTEE:

PRESIDENT, VICE-PRESIDENTS and
HENRY M. WATSON, Pres., Buffalo Railway Co., Buffalo, N. Y.
LEWIS PERRINE, JR., Pres., Trenton Pass. Railway Co. Consolidated, Trenton, N. J.
W. WORTH BEAN, Pres., St. Joseph and Benton Harbor R'y Co., St. Joseph, Mich.
MURRY A. VERNER, Pres., Pittsburgh and Birmingham Traction Co., Pittsburgh, Pa.
THOMAS C. PENINGTON, Treas., Chicago City Railway Co., Chicago.

PLACE OF MEETING, CLEVELAND, O.

OFFICERS, 1892-'93.

PRESIDENT:

D. F. LONGSTREET,

Vice-Pres. and Gen. Man., West End Street Railroad Company, Denver, Col.

FIRST VICE-PRESIDENT:

A. EVERETT,

President, East Cleveland Railroad Company, Cleveland, O.

THIRD VICE-PRESIDENT:

W. WORTH BEAN,

President, St. Joseph & Benton Harbor Electric Ry. Co., St. Joseph, Mich.

SECOND VICE-PRESIDENT:

JOEL HURT,

President, Atlanta Consolidated Street Railroad Company, Atlanta, Ga.

SECRETARY AND TREASURER:

WM. J. RICHARDSON,

Sec. and Treas., Atlantic Avenue Railroad Company, Brooklyn, N. Y.

EXECUTIVE COMMITTEE:

PRESIDENT, VICE-PRESIDENTS AND
JOHN G. HOLMES, Pres., Citizens' Traction Co., Pittsburgh, Pa.
JOHN D. CRIMMINS, Pres., Metropolitan Traction Co., New York, N. Y.
THOMAS J. MINARY, Gen. Man., Louisville Railway Co., Louisville, Ky.
JAMES R. CHAPMAN, Vice-Pres., Consolidated St. Railway Co., Grand Rapids, Mich.
BENJAMIN E. CHARLTON, Pres., Hamilton Street Railway Co., Hamilton, Ont.

PLACE OF MEETING, MILWAUKEE, WIS.

OFFICERS, 1893-'94.

PRESIDENT:

HENRY C. PAYNE,

Vice-President, Milwaukee Street Railway Company, Milwaukee, Wis.

FIRST VICE-PRESIDENT:

WILLIAM J. STEPHENSON,

President, Metropolitan Railroad Company, Washington, D. C.

SECOND VICE-PRESIDENT:

JAMES R. CHAPMAN,

Vice-President, Consolidated Street Railway Company, Grand Rapids, Mich.

THIRD VICE-PRESIDENT:

LEWIS PERRINE, JR.,

President, Trenton Passenger Railway Company, Consolidated, Trenton, N. J.

SECRETARY AND TREASURER:

WM. J. RICHARDSON,

Sec. and Treas., Atlantic Avenue Railroad Company, Brooklyn, N. Y.

EXECUTIVE COMMITTEE:

PRESIDENT, VICE-PRESIDENTS AND
D. F. LONGSTREET, Vice-Pres., West End Street Railway Co., Denver, Col.
THOMAS H. MCLEAN, Gen. Man., Citizens' Street Railroad Co., Indianapolis, Ind.
EDWARDS WHITAKER, Pres., Lindell Railway Co., St. Louis, Mo.
W. Y. SOPER, Pres., Ottawa Electric Street Railway Co., Ottawa, Can.
E. S. GOODRICH, Pres., Hartford Street Railway Co., Hartford, Conn.

PLACE OF MEETING, ATLANTA, GA.

OFFICERS, 1894-'95.

PRESIDENT:

JOEL HURT,

President, Atlanta Consolidated Street Railway Company, Atlanta, Ga.

FIRST VICE-PRESIDENT:

W. WORTH BEAN,

Pres., St. Joseph & Benton Harbor Electric Railway and Light Co., St. Joseph, Mich.

SECOND VICE-PRESIDENT:

JOHN H. CUNNINGHAM,

Director, Lynn and Boston Railroad Company, Boston, Mass.

THIRD VICE-PRESIDENT:

RUSSELL B. HARRISON,

Pres., Terre Haute Street Railway Company, Terre Haute, Ind.

SECRETARY AND TREASURER:

WM. JAMES RICHARDSON,

Director, Atlantic Avenue Railroad Company, Brooklyn, N. Y.

EXECUTIVE COMMITTEE:

PRESIDENT, VICE-PRESIDENTS AND
HENRY C. PAYNE, Vice-Pres., Milwaukee Street Railway Co., Milwaukee, Wis.
WILLIAM H. JACKSON, Pres., Nashville Street Railway, Nashville, Tenn.
D. G. HAMILTON, { Pres., Cass Ave. and Fair Grounds Ry. Co. and St. Louis R. R. Co. } St. Louis, Mo.
GRANVILLE C. CUNNINGHAM, Man., Montreal Street Railway Co., Montreal, Can.
JOHN N. PARTRIDGE, Pres., Brooklyn City & Newtown Railroad Co., Brooklyn, N. Y.

PLACE OF MEETING, MONTREAL, CANADA.

OFFICERS, 1895-'96.

PRESIDENT:

H. M. LITTELL,

Pres. Atlantic Avenue Railroad Company, Brooklyn, N. Y.

FIRST VICE-PRESIDENT:

GRANVILLE C. CUNNINGHAM,

Man. Montreal Street Railway Company, Montreal. Can.

SECOND VICE-PRESIDENT,

WILLIAM H. JACKSON,

Pres. Nashville Street Railway, Nashville, Tenn.

THIRD VICE-PRESIDENT:

J. WILLARD MORGAN,

Pres. Camden, Gloucester and Woodbury Railroad Company, Camden, N. J.

SECRETARY AND TREASURER:

T. C. PENINGTON,

Treasurer Chicago City Railway Co., Chicago, Ill.

EXECUTIVE COMMITTEE:

PRESIDENT, VICE-PRESIDENTS AND
JOEL HURT, Pres. Atlanta Consolidated Street Railway Co., Atlanta, Ga.
PRENTISS CUMMINGS, Vice-Pres. West End Street Railway Co., Boston, Mass.
C. G. GOODRICH, Vice-Pres. Twin City Railway Co., St. Paul, Minn.
A. MARKLE, Gen. Man. Lehigh Traction Co., Hazleton, Pa.
W. F. KELLY, Gen. Man. Columbus Street Railway Co., Columbus, Ohio.

PLACE OF MEETING, ST. LOUIS, MO.

OFFICERS, 1896-'97.

PRESIDENT:

ROBERT McCULLOCH,

Vice-Pres. and Gen. Man. Citizens', Cass Avenue and St. Louis Railroad Companies, St. Louis, Mo.

FIRST VICE-PRESIDENT:

CHARLES S. SERGEANT,

Gen. Man. West End Street Railway Co., Boston, Mass.

THIRD VICE-PRESIDENT:

C. F. HOLMES,

Gen. Man. Metropolitan Street Railway Co., Kansas City, Mo.

SECOND VICE-PRESIDENT:

D. B. DYER,

Pres. Augusta Railway and Electric Co., Augusta, Ga.

SECRETARY AND TREASURER:

T. C. PENINGTON,

Treas. Chicago City Railway Co., Chicago, Ill.

EXECUTIVE COMMITTEE:

PRESIDENT, VICE-PRESIDENTS AND
H. M. LITTELL, Vice Pres. and Gen. Man. Metropolitan St. Ry. Co., New York City.
H. P. BRADFORD, Gen. Man. Cincinnati Inclined Plane Railway Co., Cincinnati, Ohio.
CHARLES H. SMITH, Gen. Supt. Troy City Railway Co., Troy, N. Y.
HARRY SCULLIN, Vice-Pres. and Gen. Man. Union Depot Railroad Co., St. Louis, Mo.
GEORGE B. HIPPEE, Gen. Man. Des Moines City Railway Co., Des Moines, Iowa.

PLACE OF MEETING, NIAGARA FALLS, N. Y.

MINUTES.

TUESDAY'S SESSION.

CONVENTION HALL,
NIAGARA FALLS, N. Y.,
October 19, 1897.

The President, Mr. Robert McCulloch, of St. Louis, Mo., called the meeting to order at 11 a. m.

THE PRESIDENT—Gentlemen, in calling the meeting to order, I am pleased to announce that the first matter to receive our attention will be an address of welcome from the Mayor of the good town which is receiving us so royally, the Hon. Arthur C. Hastings, Mayor of Niagara Falls. (Applause.)

ADDRESS OF WELCOME BY HON. ARTHUR C. HASTINGS.

Mr. President and Gentlemen of the American Street Railway Association:

It hardly seems necessary for me, representing the City of Niagara Falls, to extend a welcome to an association of such a wide reputation that all cities are anxious and happy to entertain you. It seems fitting that we should have you within our gates if only long enough to show you the power we generate and send out for manufacturing. We have two large companies; one delivers current to our Buffalo neighbors, some twenty miles distant, and the other runs electric cars fourteen miles from us in another direction.

While the last few years have seen great strides in the commercial use of the great cataract, as long ago as 1725 the French sawed lumber here, with power from the Niagara River, to build old Fort Niagara. From that time forward more or less use has been made of this wonderful fall of water.

With some 200,000 h. p. being developed by the two companies we will have enough power to run a great many factories and we expect that you gentlemen in the near future will be knocking at our doors to obtain "Juice" to operate your roads for hundreds of miles about us. The roar of Niagara was heard in New York on a telephone. Why not the same energy in larger quantities and commercially? We are generous and trust you will call on us for all you want.

I have this week seen a report of the New York State Railroad Commissioners for the year 1893, and find that our local road, the Niagara Falls and Suspension Bridge Railway Company, was chartered October 20, 1882, this being their fifteenth anniversary, or crystal wedding, as it were. They have a chance to give thanks that they are alive and healthy. From the same report I find the capital invested in street railways in 1893 was something over one hundred million dollars, with some twenty million dollars gross income, in New York State alone. I also find your business was not very much better as to net profits, than a great many others in that year. From the general air of prosperity as shown in your faces, it must have improved, and I trust it will keep on improving until you will not find it necessary to have your men mention about there being "more room up front." We will not crowd you while in our beautiful city.

A few words of advice as to how to see the Falls may not be amiss, as you are here for a few days only, and most of your time will be taken up by your business. All parts of the Park are free, and it comprises over one hundred acres that are accessible by walks and roadways. The electric car service is such that you can ride for miles with only a change of cars from one road to another at two or three different points. The carriage hire is very reasonable—all reports to the contrary notwithstanding—only have it understood when you start, what the rate shall be per hour, which is regulated by ordinance. Don't think because you have driven or walked about for an hour or so you have seen it all. Take time and view the Falls and Parks from different points.

We appreciate the honor of your visit and want you to

leave with such an impression that the memory will always be pleasant.

Remember the latch-string is always out for you, and we trust you will come again, individually and collectively. We wish you all success in your deliberations. May your association grow and flourish like a green bay tree. The gates of the city are wide open to you, and the only restriction made, is that if you find anything bolted down, please leave it.

Personally, it is a pleasure for me to meet and welcome you, and I trust to have that pleasure again. (Applause.)

THE PRESIDENT—Gentlemen, I know that we are all obliged to his Honor for his warm words of welcome; and we hope that he will preside at the police court if any of us are unfortunate enough to stay out at night and be captured. (Applause.) The next business before the meeting is the calling of the roll.

The Secretary called the roll of members.

From the register of attendance it was found that the following officials of street railway companies were present:

DELEGATES OF MEMBERS.

(ARRANGED ALPHABETICALLY ACCORDING TO CITIES.)

The following persons were in attendance at the meeting representing companies that are members of the Association:

AKRON, O.....W. D. Chapman, Gen. Man., Akron St. Ry. and Ill. Co.
" " .....P. J. Boucher, Elec. Supt., Akron St. Ry. and Ill. Co.
" " .....W. D. Chapman, Jr., Akron St. Ry. and Ill. Co.
ALLENTOWN, Pa.....A. F. Walter, Sec. and Treas., Allentown and Lehigh Valley Traction Co.
" " .....Jilson J. Coleman, Dir., Allentown and Lehigh Valley Traction Co.
ALTON, Ill.....H. H. Harrison, Vice-Pres., Alton Ry. and Ill. Co.
" " .....J. G. White, Eng., Alton Ry. and Ill. Co.
ANDERSON, Ind.....Charles L. Henry, Gen. Man., Union Traction Co.
ATCHISON, Kan.....J. A. Bendure, Gen. Supt., Atchison, Ry., Light and Power Co.
ATLANTA, Ga.....Ernest Woodruff, Vice-Pres. and Gen. Man., Atlanta Consolidated St. Ry. Co.
" " .....H. N. Hurt, Supt., Atlanta Consolidated St. Ry. Co.
" " .....Frank M. Zimmerman, Supt., Atlanta Ry. Co.
AUGUSTA, Ga .....D. B. Dyer, Pres., Augusta Ry. and Elec. Co.
" " .....C. B. Reavis, Sec. and Treas., Augusta Ry. and Elec. Co.

BALTIMORE, Md.....F. L. Hart, Gen. Man., Baltimore Consolidated Ry. Co.
" " ....William A. House, Vice-Pres. and Gen. Man., Baltimore Consolidated Ry. Co.
" " ....Thomas C. Jenkins, Sec., Baltimore Consolidated Ry. Co.
" " ....S. B. Thompson, Mast. Mech., Baltimore Consolidated Ry. Co.
BATTLE CREEK, Mich. L. N. Downs, Pres. and Gen. Man., Citizens' St. Ry. Co.
" " "...F. I. Griswold, Supt., Citizens' St. Ry. Co.
BAY CITY, Mich.....W. R. Morrison, Asst. Gen. Man., Bay Cities Consolidated Ry. Co.
" " " ....A. S. Ashe, Supt., Bay Cities Consolidated Ry. Co.
BINGHAMTON, N. Y..G. Tracy Rogers, Pres., Binghamton R. R. Co.
BIRMINGHAM, Ala...James A. Stratton, Sec. and Treas., Birmingham Ry. and Elec. Co.
" " ...John B. McClary, Gen. Man., Birmingham Ry. and Elec. Co.
BOSTON, Mass.....Charles S. Sergeant, Gen. Man., West End St. Ry. Co.
" " .....Walter S. Swan, Dir., West End St. Ry. Co.
" " .....Robert H. Derrah, President's Clerk, West End St. Ry. Co.
" " .....M. Rounds, Car Draughtsman, West End St. Ry. Co.
BRIDGEPORT, Conn..Andrew Radel, Pres. and Gen. Man., Bridgeport Traction Co.
BROOKLYN, N. Y. ....H. M. Littell, Pres., Atlantic Avenue R. R. Co.
" " ....William F. Ham, Sec., Atlantic Avenue R. R. Co.
" " ....Clinton L. Rossiter, Pres., Brooklyn Heights R. R. Co.
" " ....Ira A. McCormack, Gen. Supt., Brooklyn Heights R. R. Co.
" " ....Charles D. Meneely, Aud., Brooklyn Heights R. R. Co.
" " ....David S. Moffatt, Mast. Car Builder, Brooklyn Heights R. R. Co.
" " ....Walter M. Barnaby, Acct., Brooklyn Heights R. R. Co.
" " ....F. S. Drake, Vice-Pres. and Gen. Supt., Nassau Electric R. R. Co.
" " ....William F. Ham, Sec., Nassau Electric R. R. Co.
BUFFALO, N. Y.....Henry M. Watson, Pres., Buffalo Ry. Co.
" " .....Hardin H. Littell, Vice-Pres. and Gen. Man., Buffalo Ry. Co.
" " .....Joseph S. Baecher, Sec. and Treas., Buffalo Ry. Co.
" " .....Robert Dunning, Mast. Mech., Buffalo Ry. Co.
" " .....Peter C. Deming, Supt., Buffalo Ry. Co.
" " .....M. A. Doughty, Elec., Buffalo Ry. Co.
" " .....Henry W. Box, Pres., Buffalo, Bellevue and Lancaster Ry. Co.

BUFFALO, N. Y.....Hardin H. Littell, Vice-Pres., Buffalo, Bellevue and Lancaster Ry. Co.
" " .....R. E. Danforth, Supt., Buffalo, Bellevue and Lancaster Ry. Co.
" " .....George Chambers, Supt., Buffalo Traction Co.
CAMDEN, N. J.....Justin Naramore, Supt., Camden, Gloucester and Woodbury Ry. Co.
" " .....John Mc. Isaac, Elec. Supt., Camden, Gloucester and Woodbury Ry. Co.
" " .....William S. Scull, Pres., Camden and Suburban Ry. Co.
" " .....W. E. Harrington, Gen. Man., Camden and Suburban Ry. Co.
CHESTER, Pa.....John MacFayden, Gen. Man., Chester Traction Co.
" " .....W. C. Wood, Supt., Chester Traction Co.
CHICAGO, Ills.....H. M. Sloan, Gen. Man., Calumet Elec. Ry. Co.
" " .....Frank R. Greene, Secy., Chicago City Ry. Co.
" " .....Thomas C. Penington, Treas., Chicago City Ry. Co.
" " .....G. W. Knox, Elec. Eng., Chicago City Ry. Co.
" " .....C. E. Moore, Mast. Mech., Chicago City Ry. Co.
" " .....A. C. Heidelberg, Track Foreman, Chicago City Ry. Co.
" " .....W. H. Carter, Depot Foreman, Chicago City Ry. Co.
" " .....William Weatherwax, Depot Foreman, Chicago City Ry. Co.
" " .....W. G. Price, Clerk, Chicago City Ry. Co.
" " .....George O. Nagle, Clerk, Chicago City Ry. Co.
" " .....John M. Roach, Vice-Pres. and Gen. Man., North Chicago St. R. R. Co.
" " .....J. Millan, Mast. Mech., North Chicago St. R. R. Co.
" " .....George A. Yuille, Asst. Gen. Man., West Chicago St. R. R. Co.
" " .....James R. Chapman, Man. Elec. Dept., West Chicago St. R. R. Co.
" " .....William M. Adams, Sec., National Ry. Co.
CINCINNATI, Ohio....Hardin H. Littell, Pres., Cincinnati Inclined Plane Ry. Co.
" " ....H. P. Bradford, Gen. Man., Cincinnati Inclined Plane Ry. Co
" " ....John Harris, Gen. Supt., Cincinnati St. Ry. Co.
" " ....Bayard L. Kilgour, Elec. Eng., Cincinnati St. Ry. Co.
" " ....N. H. Davis, Dir., Cincinnati St. Ry. Co.
CLEVELAND, Ohio...Will Christy, Vice-Pres. and Gen. Man., Akron, Bedford and Cleveland R. R. Co.
" " ....Frank J. J. Sloat, Supt., Akron, Bedford and Cleveland R. R. Co.
" " ....Henry J. Davies, Asst. Sec. and Treas., Cleveland Elec. Ry. Co.

CLEVELAND, Ohio....W. G. McDole, Aud., Cleveland Elec. Ry. Co.
" " ....E. J. Cook, Elec., Cleveland Elec. Ry. Co.
" " ....George A. Stanley, Pur. Agent., Cleveland Elec. Ry. Co.
" " ....W. W. Herrick, Claim Adjuster, Cleveland Elec. Ry. Co.
" " ....J. L. Crumrine, Shop Foreman, Cleveland Elec. Ry. Co.
" " ...George L. Radcliffe, Supt's Clerk, Cleveland Elec. Ry. Co.
COLORADO SPRINGS, Colo. A. L. Lawton, Gen. Man., Colorado Springs Rapid Transit Ry. Co.
COLUMBUS, Ohio.....W. F. Kelly, Gen. Supt., Columbus St. Ry. Co.
" " .....P. V. Burington, Sec. and Aud., Columbus St. Ry. Co.
" " .....M. S. Hopkins, Elec. Eng., Columbus St. Ry. Co.
COUNCIL BLUFFS, Ia. W. S. Dimmock, Gen. Supt., Omaha and Council Bluffs Ry. and Bridge Co.
COVINGTON, Ky .....James C. Ernst, Pres., South Covington and Cincinnati St. Ry. Co.
" " .....Thomas M. Jenkins, Gen. Supt., South Covington and Cincinnati St. Ry. Co.
" " .....J. M. Hutton, Dir., South Covington and Cincinnati St. Ry. Co.
DAYTON, Ohio.....George B. Kerper, Vice-Pres. and Gen. Man., People's Ry. Co.
DENVER, Colo.....C. K. Durbin, Supt., Denver Cons. Tramway Co.
DERBY, Conn.....B. W. Porter, Gen. Man., Derby St. Ry. Co.
" " .....William J. Clark, Asst. to Pres., Derby St. Ry. Co.
DES MOINES, Ia.....J. S. Goodvell, Chief Eng., Des Moines City Ry. Co.
" " .....W. G. Owens, Supt., Des Moines City Ry. Co.
DETROIT, Mich.....John Grant, Gen. Supt., Detroit Citizens' St. Ry. Co.
" " .....Thomas Farmer, Jr., Mech. Eng., Detroit Citizens' St. Ry. Co.
" " .....Charles Remelius, Mast. Mech., Detroit Citizens' St. Ry. Co.
" " .....John N. Watson, Detroit Citizens St. Ry. Co.
FALL RIVER, Mass..George W. Palmer, Jr., Elec. Eng., Globe St. Ry. Co.
FINDLAY, Ohio.....George B. Kerper, Pres., Findlay St. Ry. Co.
" " .....Charles F. Smith, Supt., Findlay St. Ry. Co.
GIRARDVILLE, Pa...E. W. Ash, Gen. Man., Schuylkill Traction Co.
HAMILTON, Ont.....J. B. Griffith, Gen. Man., Hamilton St. Ry. Co.
" " .....George D. Fearman, Acct., Hamilton St. Ry. Co.
" " .....V. H. Waggoner, Elec. and Mech. Eng., Hamilton St. Ry. Co.
" " .....F. B. Griffith, Insp., Hamilton St. Ry. Co.
HARRISBURG, Pa....Frank B. Musser, Gen. Supt., Harrisburg Traction Co.
HARTFORD, Conn....E. S. Goodrich, Pres., Hartford St. Ry. Co.
" " ...William A. Grauten, Elec. Eng., Hartford St. Ry. Co.

HAZLETON, Pa.....A. Markle, Gen. Man., Lehigh Traction Co.
" " .....George W. Thompson, Supt., Lehigh Traction Co.
" " .....C. A. B. Houck, Elec. Eng., Lehigh Traction Co.
HOUSTON, Tex.....H. C. Chase, Sec. and Asst. Treas., Houston Elec. St. Ry. Co.
JOHNSTOWN, Pa.....H. C. Evans, Special Delegate, Johnstown Pass. Ry. Co.
KALAMAZOO, Mich..L. N. Downs, Pres., Citizens' St. Ry. Co.
" " ..Dee Allen, Sec., Citizens' St. Ry. Co.
KANSAS CITY, Mo...C. F. Holmes, Gen. Supt., Metropolitan St. Ry. Co.
" " " ....Charles Grover, Elec. Eng., Metropolitan St. Ry. Co.
" " " ....J. A. G. Becker, Mast. Mech., Metropolitan St. Ry. Co.
LANSING, Mich.....L. N. Downs, Pres., Lansing City Elec. Ry. Co.
" " .....Laurence Barrett, Sec. and Treas., Lansing City Elec. Ry. Co.
LEXINGTON, Ky.....R. T. Gunn, Supt., Belt Elec. Line Co.
LOCK HAVEN, Pa....H. H. Harrison, Special Delegate, Lock Haven Elec. Ry. Co.
LONDON, Ont.....Charles E. A. Carr, Treas. and Gen. Man., London St. Ry. Co.
" " .....S. Potter, Chief Eng. and Supt., London St. Ry. Co.
LOUISVILLE, Ky.....T. J. Minary, Gen. Man., Louisville Ry. Co.
" " .....J. O. Haddox, Gen. Supt., Louisville Ry. Co.
" " .....W. O. Mundy, Station Supt., Louisville Ry. Co.
" " .....F. H. Miller, Asst. Station Supt., Louisville Ry. Co.
LOWELL, Mass.....Philip T. Begley, Supt., Lowell and Suburban St. Ry. Co.
" " .....Charles F. Bancroft, Elec., Lowell and Suburban St. Ry. Co.
LYNN, Mass.....Amos F. Breed, Pres., Lynn and Boston R. R. Co.
" " .....Elwin C. Foster, Gen. Man., Lynn and Boston R. R. Co.
" " .....John H. Cunningham, Dir., Lynn and Boston R. R. Co.
MANCHESTER, N. H..Charles Williams, Pres., Manchester St. Ry. Co.
" " ..Charles H. Bartlett, Treas., Manchester St. Ry. Co.
" " ..N. H. Walker, Man., Manchester St. Ry. Co.
" " ..Arthur H. Williams, Pur. Agent, Manchester St. Ry. Co.
MEMPHIS, Tenn.....F. G. Jones, Vice-Pres. and Gen. Man., Memphis St. Ry. Co.
" " .....C. H. Ruddock, Dir., Memphis St. Ry. Co.
MERIDEN, Conn.....N. H. Heft, Pres., Meriden Elec. R. R. Co.
MERRIMAC, Mass....J. H. Cunningham, Dir., Haverhill and Amesbury St. Ry. Co.
" " ....E. P. Shaw, Dir., Haverhill and Amesbury St. Ry. Co.
MIDDLETOWN, N. Y..O. C. G. Urban, Supt., Middletown-Goshen Traction Co.
MILWAUKEE, Wis...John I. Beggs, Gen. Man., Milwaukee Elec. Ry. and Light Co.

MILWAUKEE, Wis...T. E. Mitten, Gen. Supt. Ry. Dept., Milwaukee Elec. Ry. and Light Co.
MINNEAPOLIS, Minn..J. F. Calderwood, Sec. and Aud., Twin City Rapid Transit Co.
" " George R. Folds, Claim Agent, Twin City Rapid Transit Co.
" " Willard J. Hield, Gen. Man., Twin City Rapid Transit Co.
NASHVILLE, Tenn...Edward G. Connette, Gen. Man., Nashville St. Ry. Co.
" " ...George Swint, Mast. Mech., Nashville St. Ry. Co.
NEWARK, N. J.....John Bowen, Starter, Newark and South Orange Ry. Co.
NEW BEDFORD, Mass. A. C. Gardner, Clerk and Asst. Treas., Union St. Ry. Co.
" " Edward E. Potter, Gen. Supt., Union St. Ry. Co.
NEW BRITAIN, Conn...E. S. Breed, Gen. Man., Central Ry. and Elec. Co.
NEW BRUNSWICK, N. J..Andrew Radel, Dir., Brunswick Traction Co.
NEWBURYPORT, Mass..Charles Odell, Pres., Newburyport and Amesbury St. Ry. Co.
" " Charles H. Wilson, Dir., Newburyport and Amesbury St. Ry. Co.
NEW HAVEN, Conn..G. A. W. Dodge, Sec., Treas. and Gen. Man., New Haven St. Ry. Co.
NEW ORLEANS, La..George H. Davis, Man., Canal and Claiborne R. R. Co.
" " ..J. K. Newman, Dir., Canal and Claiborne R. R. Co.
" " ..George W. Bacon, Eng., Canal and Claiborne R. R. Co.
NEW YORK CITY....A. C. Tully, Pur. Agent, Metropolitan St. Ry. Co.
" " " ....Thomas Millen, Gen. Mast. Mech., Metropolitan St. Ry. Co.
" " " ....T. A. Delaney, Supt., Second Avenue R. R. Co.
NIAGARA FALLS, N. Y. Joseph T. Jones, Pres., Niagara Falls and Suspension Bridge Ry. Co.
" " " William B. Rankine, Vice-Pres., Niagara Falls and Suspension Bridge Ry. Co.
" " " Charles B. Hill, Sec. and Treas., Niagara Falls and Suspension Bridge Ry. Co.
" " " J. C. Brewster, Supt., Niagara Falls and Suspension Bridge Ry. Co.
NORFOLK, Va.....William Rosborough, Gen. Man., Norfolk St. R. R. Co.
NORWALK, Conn.....William F. Acton, Gen. Man., Norwalk St. Ry. Co.
" " ....A. B. Hill, Eng., Norwalk St. Ry. Co.
NORWICH, Conn.....E. P. Shaw, Jr., Gen. Man., Norwich St. Ry. Co.
" " .....W. L. Adams, Supt., Norwich St. Ry. Co.
" " .....William S. Silver, Dir., Norwich St. Ry. Co.
" " .....L. Bentley, Special Delegate, Norwich St. Ry. Co.
NO. TONAWANDA, N. Y. W. Caryl Ely., Pres., Buffalo and Niagara Falls Elec. Ry. Co.

No. Tonawanda, N. Y. Hardin H. Littell, Vice-Pres., Buffalo and Niagara Falls Elec. Ry. Co.
" " Burt Van Horn, Gen. Man., Buffalo and Niagara Falls Elec. Ry. Co.
" " C. K. Marshall, Supt., Buffalo and Niagara Falls Ry. Co.
" " Robert L. Fryer, Dir., Buffalo and Niagara Falls Elec. Ry. Co.
Oil City, Pa.....James H. Forbush, Supt., Oil City St. Ry. Co.
" " .....W. M. Jones, Elec., Oil City St. Ry. Co.
Omaha, Neb .....W. A. Smith, Gen. Man., Omaha St. Ry. Co.
Paterson, N. J.....M. R. McAdoo, Gen. Man., Paterson Ry. Co.
Philadelphia, Pa...J. C. Lugar, Man., Roxborough, Chestnut Hill and Norristown Ry. Co.
" " ...W. H. Janney, Supt., Roxborough, Chestnut Hill and Norristown Ry. Co.
" " ...John A. Brill, Dir., Roxborough, Chestnut Hill and Norristown Ry. Co.
" " ...Charles Hewitt, Elec. Supt., Union Traction Co.
Port Huron, Mich...William Canham, Pres., City Elec. Ry. Co.
" " ...H. A. Dixon, Gen. Supt., City Elec. Ry. Co.
Portland, Me.....William R. Wood, Pres., Portland R.R. Co.
" " .....Edward A. Newman, Gen. Man., Portland R.R. Co.
" " .....Charles F. Libby, Dir., Portland R. R. Co.
" " .....A. Whitney, Dir., Portland R. R. Co.
" " .....A. U. Jaastad, Eng., Portland R. R. Co.
Providence, R.I....A. T. Potter, Gen. Man., Union R.R. Co.
" " ....W. D. Wright, Elec., Union R.R. Co.
Quincy, Ill.....E. K. Stone, Jr., Sec. and Supt., Quincy Horse Ry. and Carrying Co.
" " .....H. S. Partridge, Asst. Sec., Quincy Horse Ry. and Carrying Co.
Quincy, Mass.....Benjamin J. Weeks, Gen. Supt., Quincy and Boston St. Ry. Co.
" " .....Brainard T. Dyer, Dir., Quincy and Boston St. Ry. Co.
" " .....A. D. Gore, Supt. of Con., Quincy and Boston St. Ry. Co.
Reading, Pa.....John A. Rigg, Pres., United Traction Co.
" " .....S. M. Heulings, Jr., Vice-Pres., United Traction Co.
" " .....A. V. Arrowsmith, Dir., United Traction Co.
" " .....C. A. Bragg, Dir., United Traction Co.
" " .....F. C. Randall, Dir., United Traction Co.
Richmond, Va.....R. Lancaster Williams, Treas., Richmond Traction Co.
" " .....William B. Williams, Asst. Aud., Richmond Traction Co.
" " .....A. Langstaff Johnston, Con. Eng., Richmond Traction Co.
Rochester, N.Y....J. W. Hicks, Supt., Rochester Ry. Co.
" " ....H. A. Nicholl, Supt. Motive Power, Rochester Ry. Co.

ROCHESTER, N. Y....Alfred Green, Mast. Mech., Rochester Ry. Co.
" " ....J. H. Stedman, Man. Transfers, Rochester Ry. Co.
" " ....F. M. Nicholl, Clerk, Rochester Ry. Co.
ROCKLAND, Me.....Thomas Hawken, Gen. Man., Rockland, Thomaston and Camden St. Ry. Co.
SAGINAW, Mich.....Homer Loring, Receiver, Union St. Ry. Co.
SALT LAKE CITY, U...W. S. Patterson, Mast. Mech., Salt Lake City R. R. Co.
SCRANTON, Pa.....Frank Silliman, Jr., Gen. Man., Scranton Ry. Co.
" " .....E. F. Seixas, Elec. Eng., Scranton Ry. Co.
SIOUX CITY, Ia.....Chester P. Wilson, Sec., Treas. and Gen. Man., Sioux City Traction Co.
SPRINGFIELD, Ill....T. J. Minary, Dir., Springfield Con. Ry. Co.
SPRINGFIELD, O.....S. L. Nelson, Sec., Treas. and Gen. Man., Springfield Ry. Co.
" " .....L. O. Williams, Supt., Springfield Ry. Co.
ST. JOSEPH, Mich....W. Worth Bean, Pres., St. Joseph and Benton Harbor Elec. Ry. and Lt. Co.
" " ....W. H. Hull, Sec. and Treas., St. Joseph and Benton Harbor Elec Ry. and Lt. Co.
ST. LOUIS, Mo.....Robert McCulloch, Vice-Pres. and Gen Man., Cass Ave. and Fair Grounds Ry. Co.
" " .....C. N. Duffy, Secy. and Treas., Cass Ave. and Fair Grounds Ry. Co.
" " .....Richard McCulloch, Elec. Eng., Cass Ave. and Fair Grounds Ry. Co.
" " .....Smith P. Galt, Atty., Cass Ave. and Fair Grounds Ry. Co.
" " .....Robert McCulloch, Vice-Pres. and Gen. Man., Citizens' Ry. Co.
" " .....C. N. Duffy, Secy. and Treas., Citizens' Ry. Co.
" " .....Richard McCulloch, Elec. Supt., Citizens' Ry. Co.
" " .....Smith P. Galt, Atty., Citizens' Ry. Co.
" " .....Samuel Barnes, Elec., Lindell Ry. Co.
" " .....Otto Schmit, Mast. Mech., Lindell Ry. Co.
" " .....Frank R. Henry, Sec. and Treas., Missouri R. R. Co.
" " .....Charles Green, Receiver, People's Ry. Co.
" " .....Robert McCulloch, Gen. Man., St. Louis R. R. Co.
" " .....Richard McCulloch, Elec. Eng. and Civil Eng., St. Louis R. R. Co.
" " .....Smith P. Galt, Atty., St. Louis R. R. Co.
" " .....H. O. Rockwell, Elec. Supt., St. Louis and Suburban Ry. Co.
" " .....James H. Roach, Sec. and Treas., Union Depot R. R. Co.
" " .....Thomas W. Murphy, Gen. Supt., Union Depot R. R. Co.
" " .....Charles H. Pierson, Mast. Mech., Union Depot R. R. Co.

SYRACUSE, N. Y.....Mathew Murphy, Auditor, Syracuse Rapid Transit Ry. Co.
" " .....Paul T. Brady, Dir., Syracuse Rapid Transit Ry. Co.
TAUNTON, Mass.....George C. Morse, Special Delegate, Taunton St. Ry. Co.
TOLEDO, O. .....Albion E. Lang, Pres., Toledo Traction Co.
" " .....F. B. Perkins, Supt. of Shops, Toledo Traction Co.
" " .....George A. Cooke, Asst. to Gen. Supt., Toledo Traction Co.
TRENTON, N. J.....Henry C. Moore, Pres., Trenton Pass. Ry. Co., Cons.
" " .....R. S. Woodruff, Counsel, Trenton Pass. Ry. Co., Cons.
" " .....Charles J. Flanders, Special Delegate, Trenton Pass. Ry. Co., Cons.
TROY, N. Y.....Charles H. Smith, Gen. Supt., Troy City Ry. Co.
WAKEFIELD, Mass..H. Fisher Eldredge, Dir., Mystic Valley Ry. Co.
" " ..M. C. Foye, Dir., Mystic Valley Ry. Co.
" " ..Marcellus Eldredge, Dir., Wakefield and Stoneham Ry. Co.
" " ..James F. Shaw, Dir., Wakefield and Stoneham Ry. Co.
WASHINGTON, D. C...R. F. Baker, Pres., Columbia Ry. Co.
" " ..Theodore J. King, Sec., Treas. and Supt., Columbia Ry. Co.
" " ..L. Winters, Capitol Traction Co.
WEBB CITY, Mo.....F. H. Fitch, Supt., Southwest Missouri Elec. Ry. Co.
WEST HAVEN, Conn..A. E. Pond, Supt., Winchester Avenue R. R. Co.
WHEELING, W. Va...F. H. Strieby, Representing W. A. Shirley, Sec., Wheeling Ry. Co.
WILKESBARRE, Pa...John Graham, Gen. Man., Wilkesbarre and Wyoming Valley Traction Co.
" " ..James Fagan, Elec. Eng., Wilkesbarre and Wyoming Valley Traction Co.
" " ..L. O. Hoover, Pur. Agent, Wilkesbarre and Wyoming Valley Traction Co.
WILLIAMSPORT, Pa..Ernest H. Davis, Gen. Man., Williamsport Pass. Ry. Co.
" " ..Charles T. Herrick, Asst. Supt., Williamsport Pass. Ry. Co.
WILMINGTON, Del...Thomas S. Bellat, Sec. and Treas., Wilmington City Ry. Co.
WORCESTER, Mass...Charles B. Pratt, Pres., Worcester Cons. St. Ry. Co.
" " ..A. H. Stone, Treas., Worcester Cons. St. Ry. Co.
" " ..John N. Akarman, Supt., Worcester Cons. St. Ry. Co.
" " ..C. J. Field, Con. Eng., Worcester Cons. St. Ry. Co.
YORK, Pa.....Charles H. Mayer, Treas. and Pur. Agent, York St. Ry. Co.
YOUNGSTOWN, O.....A. A. Anderson, Gen. Man. and Treas., Mahoning Valley Ry. Co.
" " ....Harry Dixon, Aud., Mahoning Valley Ry. Co.

REPRESENTATIVES OF NON-MEMBERS.

(Arranged Alphabetically According to Cities.)

Companies not members of the Association were represented as follows:

Akron, O.....C. A. Bien, Supt., Akron and Cuyahoga Falls Rapid Transit Co.
Auburn, N. Y.....G. L. Shank, Auburn City Ry. Co.
Aurora, Ills .....D. A. Belden, Gen. Man., Aurora St. Ry. Co.
Atlantic City, N. J..W. K. McAllister, Gen. Foreman, Atlantic City Elec. Ry.
Bradford, Pa. .....W. E. Mathews, Supt., Bradford Elec. St. Ry. Co.
Buffalo, N. Y.....Godfrey Morgan, Gen. Man., Buffalo, North Main St. and Tonawanda Elec. Ry. Co.
Camden, N. J.....C. M. Wickers, Pres., North Shore Traction Co.
Carbondale, Pa....John W. Aitken, Pres., Carbondale and Forest City Ry. Co.
Cedar Rapids, Ia...Royal H. Holbrook, Chief Eng., Cedar Rapids and Marion City Ry. Co.
Columbus, O.....M. W. Crabtree, Gen. Supt., Columbus Central Ry. Co.
Connellsville, Pa. David S. Fornwalt, Supt., Connellsville, New Haven and Leisenring St. Ry. Co.
Dayton, O.....D. B. Corwin, Pres., The City Ry. Co.
" " .....Thomas E. Howell, Supt., The City Ry. Co.
Dubuque, Ia.....H. G. Forbet, Gen. Man., Dubuque Light and Traction Co.
Elmira, N. Y.....William W. Cole, Gen. Man., West Side R. R. Co.
Erie, Pa. .....F. D. Emsberger, Elec., Erie Elec. Motor Co.
Exeter, N. H.....W. D. Lovell, Gen. Man., Exeter St. Ry. Co.
Fitchburg, Mass ...W. W. Sargent, Supt., Fitchburg and Leominster St. Ry. Co.
" " ..A. H. Moore, Chief Eng., Fitchburg and Leominster St. Ry. Co.
Fredonia, N. Y.....M. M. Fenner, Gen. Man., Dunkirk and Fredonia R. R. Co.
" " .....A. Kezniske, Chief Eng., Dunkirk and Fredonia R. R. Co.
" " .....H. T. Litchfield, Supt. Elec. Light, Dunkirk and Fredonia R. R. Co.
Hamilton, Ont.....C. K. Green, Supt., Hamilton Radial Elec. Ry. Co.
" " .....T. H. Watson, Dir., Hamilton Radial Elec. Ry. Co.
Hannibal, Mo.....D. Thomson, Pres. and Gen. Man., Hannibal Ry. Co.
Hoosic Falls, N. Y..C. B. Story, Sec. and Supt., Hoosic Ry. Co.
Hull, Quebec.....J. Brown, Supt., Hull and Aylmer Elec. Ry. Co.
Kingston, Ont.....George Osborne, Sec., Kingston, Portsmouth and Cataraqui Elec. Ry. Co.

KINGSTON, Ont.....Hugh E. Nickle, Asst. Man., Kingston, Portsmouth and Cataraqui Elec. Ry. Co.
" " .....J. Halliday, Dir., Kingston, Portsmouth and Cataraqui Elec. Ry. Co.
KOKOMO, Ind.....Charles L. Harry, Gen. Man., Kokomo City St. Ry. Co.
LA CROSSE, Wis.....J. M. Johnson, Elec., La Crosse City Ry. Co.
LANGHORNE, Pa. ....W. B. Parry, Supt., Newtown, Langhorne and Bristol St. Ry. Co.
LEWISTON, N.Y.....K. Evans, Sec., Lewiston and Youngstown Frontier Ry. Co.
" " .....G. R. Teller, Treas., Lewiston and Youngstown Frontier Ry. Co.
" " .....R. B. Goodman, Supt., Lewiston and Youngstown Frontier Ry. Co.
MINERAL RIDGE, Pa. D. Moynahan, Pres., Mineral Ridge and Niles St. Ry. Co.
MONTMORENCY, Que. F. H. Badger, Jr., Gen. Man., Montmorency Elec. Ry. Co.
NATICK, Mass.....George F. Keep, Supt., Natick and Cochituate St. R. R. Co.
" " .....F. P. Quackenbush, Asst. Supt., Natick and Cochituate St. R. R. Co.
NEW CASTLE, Pa....W. Cummins, —— New Castle Traction Co.
NIAGARA FALLS, N.Y. J. M. Brinker, Pres., Niagara Falls and Lewiston Ry. Co.
" " H. P. Bissell, Sec., Niagara Falls and Lewiston Ry. Co.
" " J. K. Brooks, Supt., Niagara Falls and Lewiston Ry. Co.
NIAGARA FALLS, Ont. R. A. Smith, Sec. and Treas., Niagara Falls Park and River Ry. Co.
" " W. Phillips, Gen. Man., Niagara Falls Park and River Ry. Co.
NORTH ADAMS, Mass. W. T. Nary, Gen. Man., Hoosac Valley St. Ry. Co.
OLEAN, N.Y.....Joseph McCarroll, Supt. of Con., Olean St. Ry. Co.
OTTAWA, Ill.....William F. Ellis, Pres., Ottawa St. Ry. Co.
PALATKA, Fla.....William P. Craig, Pres., Palatka and Heights St. Ry. Co.
PHILADELPHIA, Pa...D. A. Hegarty, Gen. Supt., Hestonville, Mantua and Fairmount Pass. R. R. Co.
" " ..A. Langstaff Johnston, Con. Eng., Hestonville, Mantua and Fairmount Pass. R. R. Co.
PITTSBURG, Pa.....J. M. Tate, Jr., Gen. Man., North Side Traction Co.
" " .....John Murphy, Gen. Supt., North Side Traction Co.
" " .....S. J. Macfarren, Pres., Schenley Park and Highlands Ry. Co.
" " .....R. P. Cunningham, Treas., Suburban Rapid Transit Ry. Co.
" " .....J. F. Saitz, Supt., Suburban Rapid Transit Ry. Co.
ROME, Ga.....J. B. Marvin, Treas. and Gen. Man., City Elec. Ry. Co.
SHEBOYGAN, Wis....F. I. Saemann, Treas., Sheboygan Light, Power and Ry. Co.

TOLEDO, O.....C. A. Dennman, Gen. Man., Toledo and Maumee Valley Ry. Co.
TONAWANDA, N.Y....G. P. Smith, Gen. Man., Tonawanda Elec. R.R. Co.
" " ....George L. Wells, Eng., Tonawanda Elec. R.R. Co.
" " ....F.S. Mott, Elec., Tonawanda Elec. R.R. Co.
TORONTO, Ont.....J. W. Moyes, Gen. Man., Metropolitan St. Ry. Co.
" " .....Frederic Nicholls, Dir., Metropolitan St. Ry. Co.
WARREN, O.....C. S. Bidwell, Supt., Trumbull Elec. Ry. Co.
WASHINGTON, Pa....James Kent, Supt., Washington Elec. St. Ry. Co.
WICHITA, Kan.....Herbert B. Church, Pres., Wichita Railway, Light and Power Co.
WILLIAMSVILLE, N.Y. L. L. Grove, Treas., Buffalo and Williamsville Elec. Ry. Co.

REPRESENTATIVES OF FOREIGN STREET RAILWAYS.

The following gentlemen were present :

Auguste Boissonnas, Engineer, Metropolitan Ry., Paris, France.
Gustave Fischer, Chief Asst. Eng., Government Tramways, Sydney, Australia.

NEW YORK STATE RAILROAD COMMISSIONERS.

The meeting was honored with the presence of the following members of the Board of Railroad Commissioners of the State of New York :

Ashley W. Cole, Chairman.
Frank M. Baker.
Charles R. De Freest, Secretary.

REPRESENTATIVE OF THE STREET RAILROAD ASSOCIATION OF THE STATE OF NEW YORK.

G. Tracy Rogers, President.

REPRESENTATIVES OF TRADE PAPERS.

The following representatives of the technical press were at the meeting.

AMERICAN ELECTRICIAN.
W. D. Weaver. E. E. Wood.
CANADIAN ENGINEER.
E. B. Biggar.

ELECTRICAL AGE.

Newton Harrison. W. T. Hunt.

ELECTRICAL ENGINEER.

W. J. MacConnell. W. T. Hanks.
T. C. Martin. A. C. Shaw.

ELECTRICAL REVIEW.

Stephen H. Goddard. Charles W. Price.

ELECTRICAL WORLD.

Charles T. Child. J. V. S. Church.
W. J. Johnston. Clarence E. Stump.

ENGINEERING NEWS.

Alfred E. Kornfeld. John J. Swann.

MUNICIPAL RECORD AND ADVERTISER.

T. Stoddard Beattie. J. W. Spalding.

POWER.

H. M. Swetland.

RAILROAD GAZETTE.

John N. Reynolds. Edward A. Simmons. Arthur J. Wood.

STREET RAILWAY JOURNAL.

John B. Bennett. Henry W. Blake. C. Kammeyer.
Charles B. Fairchild, Jr. E. E. Higgins. A. O. Kittredge.
James H. McGraw. C. S. McMahan. W. H. Taylor.

STREET RAILWAY REVIEW.

George J. M. Ashby. George A. Barnes. Daniel Royse.
F. S. Kenfield. H. J. Kenfield. Henry H. Windsor.

WESTERN ELECTRICIAN.

John B. O'Hara. William F. Osborne. Frank L. Perry.

OFFICIAL STENOGRAPHER.

T. E. Crossman.

The President—The next order of business is the reception of new members. Under this head an opportunity will be given for any street railway company to join the Association, which we will be glad to have done now, in order that the Secretary may enter the names on our list of members.

NEW MEMBERS.

(Arranged Alphabetically According to Cities.)

The following companies then acquired membership in the Association:

Anderson, Ind.....Union Traction Co.
Atlanta, Ga.....Atlanta Railway Co.
Binghamton, N. Y..Binghamton R. R. Co.
Buffalo, N. Y.....Buffalo Traction Co.
Brooklyn, N. Y.....Nassau Electric R. R. Co.
Chester, Pa.....Chester Traction Co.
Cleveland, O.....Akron, Bedford and Cleveland R. R. Co.
*Colorado Springs, Col. Colorado Springs Rapid Transit Co.
Middletown, N. Y..Middletown-Goshen Traction Co.
Saginaw, Mich.....Union Street Ry. Co.
Sioux City, Ia.....Sioux City Traction Co.
Wakefield, Mass...Mystic Valley Ry. Co.
Wakefield, Mass...Wakefield and Stoneham Ry. Co.
Webb City, Mo.....Southwest Missouri Electric Ry. Co.

*[This Company has paid all arrearages of dues after being suspended, and is reinstated as a member in good standing.]

APPROVAL OF MINUTES OF LAST REGULAR MEETING.

The President—The next business is the approval of the minutes of the last meeting, which have been printed in our annual report, of which each member has received several copies. We would like to know if there is any point in which they are not correct before they are approved. I might add that the minutes of the last meeting were printed and distributed in thirty days after the meeting.

Mr. Kelly, Columbus—Mr. President, I move that the minutes be approved as printed. Carried.

ADDRESS OF THE PRESIDENT.

President McCulloch read the following address:

Gentlemen of the American Street Railway Association:

Our Convention Assembly for the Sixteenth Annual period is within the sound of Nature's greatest wonder, but the wonders that are wrought in our own immediate application and appropriation of Nature's resources are even more startling and awe-inspiring than the great Niagara Cataract. If our ancestors of two centuries ago could sit in

judgment on our doings of to-day, we would unquestionably be required to involuntarily undertake the feat of the gallant Capt. Webb, and if, perchance, we survived the perils of the raging torrent, the bonfires of our aboriginal predecessor would be rekindled on the cliffs below, and a fat-frying would take the place of our discussions and merry-making, as there could be no escape on our part from the charge of witchcraft. These great Falls were worshipped by our red brother; the venturesome explorer and historian dipped his pen in consecrated fluid as he wrote reverentially of their grandeur; the poet and the maiden everywhere have sung of them in enchanting praise; reverence and poetry and romance have characterized the stories which tell us of them; but the matter-of-fact Yankee of to-day, casting reverence and poetry and romance to the winds, has harnessed them like an old plow-horse, and compelled them, just as subserviently, to do his bidding; they make heat and light, and power for all purposes, they revolutionize the processes of the manufacturer and the chemist, and ere we meet here again they will, without doubt, have been saddled with the menial duties of cooking and washing and tilling the soil of all the country around. The enabling element for the utilization of this wasted energy of the past is electricity, in the development and search for uses of which, the scientist and manufacturer sleep not, neither do they rest. They furnish us with their best and latest devices and appliances to-day, and to-morrow these devices and appliances are obsolete; to keep our place in the procession we must join in the cry of "the King is dead, long live the King;" we must discard the old and adopt the new, or else be ground under the wheels of this Juggernaut of Progress. Unfortunately, if we endeavor to "shun Scylla we are in danger of being wrecked on Charybdis," hence we assemble here to counsel together as to how we may best shape our course. To learn more of this revolutionary factor in our business, to discuss this and other kindred subjects, to compare our experiences, to meet and greet each other, to renew old friendships and acquaintance and to form new ties, to be forced, if need be, to recognize that "there are other pebbles," to find that the American Street Railway Association is filled with men to know whom is both an honor and a pleasure; these, my friends, are some of the things which have brought us together, and it is hoped that a full measure of pleasure and profit will reward all who honor us with their presence.

Our local brethren, with a hospitality as abounding and exhaustless as the never-ceasing flow of their great river, have provided for our physical comfort and entertainment. We beseech them not to seduce us from a proper contemplation of the business before us.

Our noble ally; our helper in all the good work we accomplish; our always-alert, jovial and genial friend, the supply man, has contributed, as usual, his share to our entertainment and enlightenment. He is here to show us the best of everything he has. He is not, in one sense, a member of our Association. He does not participate in our delibera-

tions, but he stands at our threshold and the vigilance which he exercises that none may escape is worthy of our emulation in the conduct of our business. Let us show our appreciation of his efforts by inspecting his wares, by loading him with orders, and by fraternizing with him, that his enjoyment of the occasion may be equal with ours.

We have still another and a new element in our gathering for this year. Whilst we are here engaged in the discussion of questions pertaining to the construction, equipment and operation of the roads and interests in our keeping, there is assembled near by, and also in deliberative convention, an earnest, intelligent, enthusiastic body of mostly younger men than ourselves. They have in view the same objects which brings us together, a betterment in the performance of street railway work. Their duties, whilst distinct and apart from ours, are just as essential, and the requirement is for the same degree of intelligence, industry and integrity. Their organization is young and they are just starting out in their efforts to enlighten each other by a mutual interchange of information as to methods and ways. I allude to the Street Railway Accountants' Association. Let us extend to them not the right hand, but both hands, and help and encourage them to persevere in their good work. Their interest and efficiency in the performance of their duties is susceptible of the same betterment by conventions as ours. If they find it desirable and convenient to meet at the same time with ourselves, and thus extend the acquaintance and good fellowship between the operating and accounting departments which must result from contact, let that arrangement continue; but if it be considered wiser to have two separate meeting times and places, that may be the plan, but they should have our encouragement and endorsement, and even financial support, if necessary.

Our meetings are always attended by quite a number of persons engaged in the same business with ourselves, but whose companies are not members of the Association, and we receive requests for information from the same source, which information is always cheerfully given. We would not like to close our doors against these non-members, but we would be glad to enter their names in our official lists, and their annual dues, which is only a small amount, would fill an aching void in our treasury.

There is still another class who, although members of our Association, seldom or never grace our meetings with their presence. Whether this may be from lack of time, a feeling of exclusiveness or a consciousness of a possession of all the knowledge attainable concerning our business, I know not. But if the first, an effort and sacrifice might be made experimentally; if the second is the cause of their absence, a surprise and discovery is in store for them if they will only develop it; and if the last reason keeps them away, a feeling of charity and good-will for their fellow laborers should impel them to come amongst us and show us how to surmount our perplexing obstacles.

The questions to be discussed in our convention have been selected with reference to newer developments and applications. The gentlemen honored by the selection (and the honor should be much coveted) to prepare papers have all been urged to be present and personally present their efforts, thus giving them a force that can only be imparted by the enthusiasm of the author. Time will be given for the presentation and discussion of each paper, and it is hoped the discussions will be free and exhaustive.

I wish that my successor in office may have a Secretary and Executive Committee, who so thoroughly realize and faithfully perform their duties as have the Secretary and Executive Committee who have assisted me in the performance of my very pleasant work.

And now, my friends and brethren, thanking you with more earnestness than my language can express, for the unexpected honor with which you crowned me a year ago, and promising an impartial ruling on all questions presented, we will proceed with the business of the Convention. [Applause.]

THE PRESIDENT—The Report of the Executive Committee is the next business to come before the meeting.

REPORT OF THE EXECUTIVE COMMITTEE.

THE SECRETARY read the report, as follows:

TO THE AMERICAN STREET RAILWAY ASSOCIATION,

Gentlemen:—The report of your Executive Committee will consist, as in past years, of the minutes of the several meetings held during the past year, which will show what has been done by your Committee.

MINUTES OF SPECIAL MEETING OF THE EXECUTIVE COMMITTEE HELD AT THE PROSPECT HOUSE, NIAGARA FALLS, FEBRUARY 15, 1897.

PRESIDENT MCCULLOCH called the meeting to order at 10:15 o'clock a. m.

There were present, Messrs. McCulloch, Sergeant, Dyer, Holmes, Bradford, Hippee and Penington.

THE TREASURER presented a financial statement to February 12th, 1897.

THE SECRETARY stated that collections for space at the St. Louis Exhibition were still outstanding, viz.:—Bundy Mfg. Co., $10.00; Cutter Electrical Mfg. Co., $10.00; Graham Mfg. Co., $20.00; D. P. Shields, $10.00. Total, $50.00.

On motion of MR. DYER, the Secretary was instructed to cancel the foregoing amounts.

Messrs. W. Caryl Ely, H. H. Littell, Burt Van Horn and Charles B. Hill, of the local railway companies, here waited upon the Committee, and made an appointment for the Executive Committee to meet at the Niagara Club at twelve o'clock, to discuss with a Committee from the Chamber of Commerce of Niagara Falls the arrangements for the forthcoming meeting.

THE SECRETARY brought up the following resolution, offered at the St. Louis meeting by Mr. Davis, of Williamsport, and referred to the Executive Committee:

Resolved, That the Secretary be instructed to obtain from the members of the Association information and copies of municipal legislation relating to the imposition by their cities or municipalities, of taxes or license fees upon their property, franchise or receipts.

MR. DYER moved that it is the sense of the Committee that at the present time it is deemed impracticable to take up the question involved in this resolution. Carried.

The matter of subjects of papers for the next meeting was then taken up, and the Secretary read a list of topics which had been suggested by various members.

PRESIDENT MCCULLOCH stated that the Secretary should write to each person selected to read a paper, impressing upon him that the paper should be read by him at the meeting.

PRESIDENT MCCULLOCH stated that the correspondence which he had had up to the present time with the local people at Niagara Falls was very unsatisfactory. He then read several letters which he had received.

THE SECRETARY read a letter from the street railway companies of the city of Detroit, inviting the Association to hold its meeting in that city in 1897, in case, for any reason, it was deemed advisable to change the place of meeting from Niagara Falls.

The Committee then adjourned, subject to the call of the Chair.

THE EXECUTIVE COMMITTEE then proceeded to the rooms of the Niagara Club. At that place they met President Ely and General Manager Van Horn, of the Buffalo and Niagara Falls Electric Railway Company; President Brinker, of the Niagara Falls and Lewiston Railroad Company (the "Great Gorge Route"); Vice-President Littell, of the Buffalo Railway Company, and Treasurer Hill, of the Niagara Falls and Suspension Bridge Railway Company. Also Mayor Arthur Schoellkopf, of Niagara Falls, and Messrs. William S. Humbert, H. W. Beardsley, A. J. Thibeaudau and E. T. Williams, members of the Chamber of Commerce of Niagara Falls.

All the matters relating to the necessary arrangements for the Convention were entered into fully and pointedly, and after lengthy discussion, the Executive Committee retired, to consider the matters further.

EVENING SESSION.

PRESIDENT MCCULLOCH called the Committee to order at 8 o'clock p. m.

Present, the same gentlemen as at the morning session.

THE PRESIDENT announced the business in order to be the selection of topics for papers for the next meeting, and of gentlemen to read the same.

MR. HIPPEE moved the following subject: "Municipal Ownership of Street Railways," paper by Mr. P. F. Sullivan, General Manager, Lowell and Suburban Street Railway Company, Lowell, Mass.

MR. BRADFORD moved the following subject: "Some of the Difficulties in the Construction and Operation of Electric Railways of To-Day," paper by Mr. George W. Knox, Electrical Engineer, Chicago City Railway Company, Chicago, Ill.

MR. HOLMES moved the following subject: "Application of Electricity to Railroads now operated by Steam Power," paper by Mr. N. H. Heft, President, Meriden Street Railway Company, Meriden, Conn.

MR. SERGEANT moved the following subject: "The Best Method of Settling Damage Cases and the Prevention of Accidents by the Use of Fenders or Otherwise," paper by Mr. C. G. Goodrich, General Manager, Twin City Rapid Transit Company, Minneapolis, Minn.

MR. DYER moved the following subject: "Storage Batteries for Street Railways," paper by Mr. Charles Hewitt, Electrician, Union Traction Company, Philadelphia, Pa.

MR. HIPPEE moved the following subject: "Discipline of Employes," paper by Mr. George H. Davis, Superintendent, Canal and Claiborne Railroad Company, New Orleans, La.

MR. BRADFORD moved the following subject: "Power Distribution and the Use of Multiphase Current Transmission for Ordinary Street Railways," paper by Mr. Maurice Hoopes, Electrician, Lynn and Boston Railroad Company, Lynn, Mass.

MR. DYER moved that in case any of the persons selected should for any reason decline to prepare the paper, the President be authorized to select another gentleman; and the papers be prepared so as not to exceed thirty minutes in their reading. Carried.

At this point Messrs. Ely, Beardsley, Thibeaudau and Williams waited upon the Committee, and after a very full and thorough discussion of the matter, the arrangements for the meeting were agreed upon.

THE SECRETARY read a communication from Mr. W. F. Kelly, of Columbus, Ohio, in regard to changing the time of meeting from October to September, which letter was accompanied by a number from other street railway men, connected with the Association, to the same effect.

MR. HIPPEE gave notice of the following amendment to Section VII. of the By-Laws: Insert in place of the words "on the third Tuesday in

October in each year, at such hour and place as shall be designated at the preceding meeting," the following, to wit: "At such time in the month of September or October in each year as the Executive Committee may decide to be suited to the locality in which the meeting is to be held; the time to be decided upon and each member of the Association notified of the selection by the first day of March in the year in which the meeting is to be held."

Under the rules action on this amendment was deferred until the meeting of the Association.

MR. HOLMES moved that a vote of thanks be returned to the Detroit Railway Companies and Messrs. Swartz Brothers, of the Hotel Cadillac, Detroit, and the Nashville Street Railway, for their kind invitations to meet in their cities. Carried.

MR. DYER moved that the adjustment of the claim of Messrs. Richardson and Hook for $210.00 be left with the President and Secretary for such adjustment and settlement as they deem just and proper. Carried.

On motion of MR. HOLMES, adjourned, subject to the call of the Chair.

TUESDAY'S SESSION.

During the course of a complimentary dinner tendered by Messrs. Watson and Littell to the members of the Executive Committee at the Ellicott Club, at Buffalo,

MR. HIPPEE moved that the Secretary be authorized to have prepared a steel plate engraving of the former Secretary, Mr. W. J. Richardson, and also an engraving of himself, to be sent to the members of the Association. Carried.

MINUTES OF SPECIAL MEETING OF THE EXECUTIVE COMMITTEE HELD AT THE INTERNATIONAL HOTEL, NIAGARA FALLS, OCTOBER 18, 1897.

PRESIDENT MCCULLOCH called the meeting to order at 3 p. m.

There were present, Messrs. McCulloch, Sergeant, Dyer, Littell, Bradford, Smith and Penington.

SECRETARY PENINGTON read the minutes of special meeting of the Executive Committee held February 12, 1897.

MR. LITTELL moved that the minutes be approved, as read. Carried.

THE SECRETARY read a letter from Mr. George B. Hippee, regretting his inability, on account of business, to attend the meeting of the Executive Committee.

THE SECRETARY stated that he had received a letter from Mr. C. G. Goodrich, Vice-President, Twin City Rapid Transit Co., Minneapolis, stating that he was unable to write the paper on "Best Methods of Settling Damage Cases and Prevention of Accidents by the Use of Fenders or Otherwise," as he could not devote the necessary time to it; but that Mr. W. J. Hield, General Manager of the Company, would do so.

THE SECRETARY presented the Treasurer's financial statement to October 12, 1897.

THE PRESIDENT appointed Messrs. Sergeant and Dyer an auditing committee to examine the accounts of the Treasurer.

THE SECRETARY announced the following deaths during the year:

WILLIAM H. SINCLAIR, Ex-President, Galveston City Railroad Co., Galveston, Tex. January 11, 1897.

A. M. BILLINGS, President, Memphis Street Railway Co., Memphis, Tenn. February 7, 1897.

JOHN RADELL, Vice-President, Brunswick Traction Co., New Brunswick, N. J. May 9, 1897.

THE PRESIDENT appointed Messrs. Dyer and Smith a committee to obtain the necessary information and prepare suitable memorials upon the deaths of these deceased members.

MR. LITTELL moved that the Secretary be authorized to send to the families of the deceased members copies of the memorials. Carried.

THE SECRETARY read a letter from Mr. H. F. MacGregor, regarding the requirements and regulations with reference to electric lighting from street railway circuits.

On motion, the letter was referred to the Secretary, with authority to investigate the subject and reply to Mr. MacGregor.

MR. DYER moved that the action of the Executive Committee of last year, with reference to the issuing of banquet tickets, be reaffirmed; that there shall be issued two banquet tickets to each member Company of the Association where there are two or more official representatives, and where there is only one such representative, only one ticket shall be issued; and where a company is not represented no banquet ticket shall be issued on account of such Company. Carried.

MR. DYER moved that each author of a paper read at the meeting and each speaker at the banquet be provided with a complimentary ticket, and also for their wives, if they accompany them. Carried.

THE SECRETARY reported that three sets of legal decisions, aggregating 208 pages, had been issued during the year.

MR. SERGEANT read a letter from the Massachusetts Street Railway Association, inviting the Association to hold its next meeting in Boston.

MR. BRADFORD presented a like invitation from the Cincinnati League, to hold the meeting in Cincinnati.

MR. BRADFORD moved that the Secretary be authorized to have

printed cards of admission to the Exposition; the same to be placed in the hands of Messrs. H. H. Littell and Burt Van Horn, to be circulated at their discretion.

PRESIDENT MCCULLOCH expressed his thanks for the courtesy of the members of the Executive Committee, and the promptness with which they had transacted the business of the Association. Adjourned.

MR. BEAN, St. Joseph—I move that the report of the Executive Committee be approved and spread upon the minutes; and that we extend to the Executive Committee a vote of thanks for the efficient manner in which they have discharged the duties of their office. Carried.

THE PRESIDENT—The report of the Secretary and Treasurer is the next business.

REPORT OF THE SECRETARY AND TREASURER.

THE SECRETARY read the report as follows:

TO THE AMERICAN STREET RAILWAY ASSOCIATION.

Gentlemen:—Your Secretary and Treasurer respectfully submits the following report:

FINANCIAL STATEMENT.

Cash on hand, October 15, 1896		$1,640 94
RECEIPTS TO OCTOBER 12, 1897.		
Annual Dues	$3,789 58	
Membership Fees	375 00	
Space, Exhibit Hall, 1896	2,146 30	
Space, Exhibit Hall, 1897	180 00	
		6,490 88
		$8,131 82
EXPENSES TO OCTOBER 12, 1897.		
Printing and Stationery	$1,762 67	
Postage	140 71	
Miscellaneous Expenses	75 56	
Salaries	1,500 00	
Executive Committee, 1897	416 55	
15th Annual Convention, 1896	1,074 85	
16th Annual Convention, 1897	230 00	
		5,200 34
Cash on hand, October 12, 1897		2,931 48
		$8,131 82

ASSETS, OCTOBER 12, 1897.

Cash in Bank	$2,931 48	
Space, Niagara Falls Exhibition, unpaid	1,500 00	
Dues unpaid	350 00	
		4,781 48

LIABILITIES.

Richardson & Hook	210 00
Net assets	$4,571 48

We have examined the cash account of T. C. Penington, Treasurer, and find the same correct and supported by proper vouchers.

(Signed,) C. S. SERGEANT,
D. B. DYER,
Auditing Committee.

NIAGARA FALLS, Oct. 20, 1897.

MEMBERSHIP.

October 15, 1896	160

NEW MEMBERS, TO OCTOBER 15, 1897.

ALTON, Ill	Alton Ry. and Illuminating Co.
ATCHISON, Kan	Atchison Railway, Light and Power Co.
BATTLE CREEK, Mich.	Citizens' Street Ry. Co.
CHICAGO, Ill	South Chicago City Ry. Co.
GIRARDVILLE, Pa	Schuylkill Traction Co.
HOUSTON, Tex	Houston Elec. St. Ry. Co.
KALAMAZOO, Mich	Citizens' St. Ry. Co.
LANSING, Mich	Lansing City Elec. Ry. Co.
MERIDEN, Conn	Meriden Elec. R. R. Co.
MEXICO, S. America	Compania de Ferrocarriles del Distrito Federal de Mexico
NIAGARA FALLS, N. Y.	Niagara Falls and Suspension Bridge Ry. Co.
NORTH TONAWANDA, N. Y.	Buffalo and Niagara Falls Ry. Co.
RICHMOND, Va	Richmond Traction Co. 13
	173

WITHDRAWN.

CARBONDALE, Pa	Lackawanna Valley Rapid Transit Co.
CHICAGO, Ill	Chicago Passenger Railway Co.
CHICAGO, Ill	South Chicago City Railway Co.

GENEVA, N. Y.	Geneva, Waterloo, Seneca Falls and Cayuga Lake Traction Co.	
HOUSTON, Tex	Houston City Street Ry. Co.	
NEW YORK CITY, N.Y.	Eighth Avenue Railroad Co.	
OTTAWA, Ont.	Ottawa Electric Ry. Co.	
PHILADELPHIA, Pa.	Hestonville, Mantua and Fairmount Passenger R. R. Co.	
PITTSBURG, Pa.	Federal Street and Pleasant Valley Ry. Co.	
TOLEDO, O.	Toledo Elec. St. Ry. Co.	
VINCENNES, Ind.	Vincennes City St. Ry. Co.	
WASHINGTON, D.C.	Eckington and Soldiers' Home Ry. Co.	12
		161

DUES UNPAID.

AKRON, O.	Akron Street Railway Co.	$ 25 00
*BUFFALO, N. Y.	Buffalo, Bellevue and Lancaster Railway Co.	25 00
GREAT FALLS, Mont.	Great Falls Street Railway Co.	25 00
KALAMAZOO, Mich.	Citizens' Street Railway Co.	25 00
MONTREAL, Canada.	Montreal Park and Island Railway Co.	25 00
NEWBURYPORT, Mass.	Newburyport and Amesbury Horse Railroad Co.	25 00
NEW YORK CITY.	Dry Dock, E. Broadway and Battery Railroad Co.	25 00
PITTSBURG, Pa.	Allegheny Traction Co., 1896 and 1897.	50 00
PITTSBURG, Pa.	Central Traction Co.	25 00
PITTSBURG, Pa.	Duquesne Traction Co., 1896 and 1897.	50 00
STEELTON, Pa.	Middletown, Highspire and Steelton Railway Co.	25 00
WEST SUPERIOR, Wis.	Superior Rapid Transit Co.	25 00
		$350 00

* Paid since report was presented.

I desire to express my thanks to the street railway and electrical press for its uniform courtesy in publishing all notices and information sent out from the Secretary's office.

Respectfully submitted,

T. C. PENINGTON,
Secretary and Treasurer.

MR. RIGG, Reading—I move that the report of the Secretary and Treasurer be received and filed, and spread upon the minutes. Carried.

LETTERS AND TELEGRAMS OF REGRET FROM MEMBERS.

THE SECRETARY read the following letters :

TWIN CITY RAPID TRANSIT CO.,
MINNEAPOLIS, MINN., October 16, 1897.

COL. H. M. WATSON, ESQ.,
BUFFALO, New York.

Dear Colonel:—I fully intended starting for New York to-morrow evening, stopping in Syracuse for a few hours and going from there direct to the Convention, arriving at Niagara Falls the 20th. Unfortunately, however, a man for whom I have been waiting two weeks arrived from New York yesterday and I must go with him to Duluth. Consequently, I cannot return in time to get to Niagara to the Convention. I am very sorry for this as I had many pleasant anticipations of renewing old acquaintances. Please present my regards and regrets to all my friends. If this were not a very important business matter I would not let it interfere, but under the circumstances I cannot do otherwise than the above.

Sincerely yours,

THOMAS LOWRY, President.

[TELEGRAM.]

CITY OF MEXICO, October 19, 1897.

TO AMERICAN STREET RAILWAY ASSOCIATION,
NIAGARA FALLS.

Regret my inability to meet old friends at the sixteenth annual meeting. Best wishes for the continued success of the Association.

THOS. H. McLEAN, President,
COMPANIA DE FERROCARRILES
DEL DISTRITO FEDERAL DE MEXICO.

[TELEGRAM.]

NEW YORK, October 19, 1897.

TO ROBERT McCULLOCH,
PRESIDENT, AMERICAN STREET RAILWAY ASSOCIATION.

I regret my plan to be with you Wednesday and Thursday has been broken by imperative meetings. Best wishes for success of Convention and regret that I am unable to meet many eminent street railway men with you.

H. H. VREELAND, President,
METROPOLITAN STREET RAILWAY CO.

NEW ORLEANS TRACTION CO., LTD.
NEW ORLEANS, LA., October 12th, 1897.

ROBERT MCCULLOCH, ESQ., President,
AMERICAN STREET RAILWAY ASSOCIATION,
ST. LOUIS, MO.

Dear Sir:—I have been anticipating with a great deal of pleasure the privilege of answering "Here," when the Secretary should call the name of the New Orleans Traction Company on the occasion of the assembling of the members of the Association in the Convention at Niagara Falls on the 19th. I have during the year from time to time jotted down a statement of problems which have arisen in my practice of the science of electric railroading, and which had caused me to stumble, to present them for solution to the many gentlemen so much more expert than myself in these matters, who would be present at the convocation. From the papers to be read, I looked for great gain and help, and from the dicussions likely to arise, I expected to get at facts and figures which would be of great use to me, while on the social side, I have been longing for a glimpse of the natural beauties which surround the Convention location, and for the chance of exchanging greetings with the many friends whom I have loved and respected for so many years, and to whose intimacy I have been so kindly admitted during our acquaintance. You can then readily judge of how great my disappointment is in not being able to compass any of the above list this year. To be obliged to be absent from my place in the Convention Hall this year causes me more regret than I can express in words.

The hospitality of the city over whose principal railway stystem I have the honor to preside is proverbial. When a stranger arrives in our midst, especially he be a celebrated personage, without reference to whether that celebrity arises from good or ill characteristics, or whether his stay may prove disagreeable, subsequent to his advent, the good citizens of this Crescent City, turn out *en masse* to greet him, and spare no pains to make him welcome, and lest he should find anything wanting in his reception, and hasten his departure to bestow his attention upon other places, they do their utmost to keep him to themselves. The only instance on record where such hospitality was not in evidence occurred, as I understand it, when General Benjamin F. Butler paid New Orleans a visit a few years ago, but even on that occasion, whatever the citizens lacked in cordiality toward the old General, it is reported, they made up to him in the liberal bestowment upon him of their spoons. Even after he had left New Orleans (the only thing I believe he did not take with him), he was invited to return, but the invitation was couched in such terms of earnestness, it is possible the General feared the citizens might overdo it, and he declined.

We have in our midst to-day, a guest who came to us about two months ago. He did not announce his arrival, but with the alertness pe-

culiar to our people, some one (name unknown) found him out. Ever since he has been with us, he has been the recipient of most careful and constant attention. We promptly notified the world at large of his advent, and the residents of towns and villages outside of our precincts have ably assisted us in preserving from ruin our reputation for hospitality by permitting our guest to leave, and have come to our assistance by instructing the railroads in rules of etiquette through the reading to them of excerpts from "Winchester's Metallic Edition of How to Perforate the Human Body," to which lectures, the common carriers have listened with great interest, showing their appreciation of the subject matter "in hand," by reversing levers. Thus have we been assisted by the country round about us, and in the city, old and young, rich and poor, educated and illiterate, have not failed to do our distinguished guest reverence. Wherever he has taken up his domicile, and he has been gracious enough to go about to a good many places, the premises have been elaborately decorated with his colors. Over the portal of each residence that he has visited has been hung his flag. This is two hued; one-half recalls an orange, and the other, a strawberry, the *tout ensemble* of the whole being not unlike a Martini cocktail with a cherry in it. In front of his abode, night and day, a committee on reception, to the number of two, are always at hand to see that the guest is not unnecessarily disturbed, and that none of the inmates of the residence wherein he is ensconced so far forget their duties as hosts as to leave the premises. When his lordship finally concludes to depart from any particular residence or hotel, there is such sorrow that those he has left behind purify their minds and bodies the better to bear up under the heart-rending leave taking, and so sacred are the articles that have been worn by the departed guest, that everything he has touched, even including the bed on which he has rested, is incinerated, so that mortal hands of common clay may never profane these sacred sundries. For fear that this guest, when he walks the streets, should accidentally find dirt or the slightest bit of filth thereon, a coating of lime has been made to adorn the edge of nearly all sidewalks. On a bright moonlight night, when the thermometer registers 85 degrees Farenheit, the eye is deceived into thinking it has been snowing, but the other senses are not. Every car within my jurisdiction, which is in actual service, is daily treated to a bath consisting of a solution of bi-chloride of mercury, so that should our guest ever enter one, he will not be liable to contamination through contact with other passengers. So great is the awe and reverence in which we hold him, that his name is mentioned with bated breath, and therefore, I forbear here to pronounce his august appellation. It is possible that you and the gentlemen of the Convention, will, without further description, be able to recognize the one of whom I have been speaking. You will, therefore, see that my duties as a citizen, as a hospitable inhabitant of this Southern land, cannot be easily set aside

for the purposes of my own pleasure, and I am, therefore, denied being with you at the Convention.

I trust all your deliberations may be thoroughly harmonious, engaging in interest, full of suggestion and assistance to all who shall participate therein, and that you may all have the best and jolliest time ever granted the American Street Railway Association's delegates and friends. Bear in mind, please, that I am with you in spirit, and accept my most cordial greetings for yourself and all my street railroad associates.

Most sincerely yours,

C. D. WYMAN.

The following letters were also read:

BUFFALO RAILWAY COMPANY,
BUFFALO, NEW YORK, October 18, 1897.

MR. T. C. PENINGTON,

SECRETARY, AMERICAN STREET RAILWAY ASSOCIATION,

NIAGARA FALLS, N. Y.

Dear Sir:—This Company extends an invitation to the members of your Association to examine their track and overhead construction, and also to visit their buildings and power house.

In the power house they will see belt-driven and direct-coupled generators to engines, and rotary converters using power from Niagara Falls, and all generating electricity for propelling street cars.

The manner of handling coal and firing boilers would be very interesting to some of the members of the Association.

Yours very truly,

BUFFALO RAILWAY COMPANY,

H. H. LITTELL,

Vice Pres. and Gen. Manager.

THE DUPLEX CAR COMPANY,
CATARACT HOUSE, NIAGARA FALLS,
October 18, 1897.

T. C. PENINGTON, ESQ.,

SECRETARY, AMERICAN STREET RAILWAY ASSOCIATION.

Dear Sir:—Capt. John M. Brinker, President of the "Great Gorge Route," has extended the courtesies of his road to the Duplex Car Company during the meeting of the American Street Railway Asssociation at Niagara Falls, and one of the Duplex cars, built expressly for this exhibition, will be run over the tracks of the Great Gorge Route for especially made-up parties from the committees, members and delegates to the Convention.

The Duplex Car Company extends a cordial invitation to the officers and members of the Association to take a ride over the Great Gorge Route, at such an hour as will suit their convenience, after eleven o'clock, Tuesday morning, the 19th day of October.

The car will be stationed at the terminus of the railroad on Falls street, near the Park.

Respectfully yours,

JOHN A. LOWELL,
President.

MR. H. H. LITTELL, Buffalo—Mr. President, if I am in order, I desire to offer a resolution which bears upon a subject touched upon in the President's address.

RESOLUTION RELATIVE TO THE STREET RAILWAY ACCOUNTANTS' ASSOCIATION OF AMERICA.

WHEREAS, the American Street Railway Association, through the report of its President, has been officially informed of the organization of the Street Railway Accountants' Association of America, and

WHEREAS, the aims and objects of that Association are to bring together those engaged in the accounting department of Street Railways for the interchange of ideas, to promote the adoption of a simple, concise and uniform system of accounts, and to improve the work of the accounting department, and

WHEREAS, that Association is now in convention assembled in this building;

Therefore, be it Resolved, That the American Street Railway Association, believing that the attainment of the aims and objects of the Accountants' Association will be of permanent benefit to the Street Railways of America, heartily endorses and approves of the organization of that Association and pledges to it their cordial encouragement and support.

The resolution was unanimously adopted.

THE PRESIDENT—Has any member anything to bring up in connection with the preliminary business now before the Convention? If not, we will proceed to the regular order of business, which is the reading of papers. The first paper is on "Municipal Ownership of Street Railways," by Mr. P. F. Sullivan, General Manager, Lowell and Suburban Railway Co., Lowell, Mass. As Mr. Sullivan is not present, the Secretary will read the report.

REPORT OF THE COMMITTEE ON "MUNICIPAL OWNERSHIP OF STREET RAILWAYS."

THE SECRETARY read the report as follows:

Mr. President and Gentlemen:—The subject of this paper is one which cannot be treated properly, or in other than a limited manner, within the time and space permitted. What I shall write, therefore, is intended more to suggest lines along which others may follow, rather than to attempt to treat it exhaustively.

The subject will be considered under the two following heads: Municipal administration in American cities is so extravagant and unbusinesslike that, in the interest of the public, the powers and duties of municipalities should be reduced rather than be enlarged.

Municipal ownership and operation abroad are the exception rather than the rule; and were the reverse true, and such ownership and operation successful from a financial point of view, it does not follow that American cities could or should follow such examples, or that if they did so, success would result.

As to whether we should experiment with socialism, particularly under our forms of municipal government, while still going through the experimental stage, and as to whether popular government should compete with private enterprise, I leave for other and separate discussion.

MUNICIPAL MALADMINISTRATION.

Thoughtful men view with alarm the growth of American cities, and the maladministration of their affairs; some go so far as to believe that both conditions seriously threaten the future of the Republic. So alarming have these become that patriotic and thoughtful men, and women, too, have organized in nearly every city in the country with a view of arousing public opinion, of devising ways and means to purify local politics, and to obtain a fair return for money expended.

In nearly every large city in every state in the Union, from Maine to California, and from Oregon to Florida, such organizations exist under one name or another, and in some cities they go so far as to employ counsel and to instruct city governments in their duties. This is true of Boston, Providence, New York, Baltimore, New Orleans, Chicago, San Francisco and other cities. At the present time there are over fifty of such organizations in existence.

Not only are there local organizations, but such organizations also send delegates to National Conferences to adopt methods of arousing public opinion and purifying local politics in every city in the Union. Conferences for good city government were held at Philadelphia in 1894, at Minneapolis and Cleveland in 1895; at Baltimore in 1896; and at Louisville in 1897. To show how general and widespread are municipal maladministration and corruption throughout the country, I quote below extracts from the remarks of a few of the delegates.

PHILADELPHIA CONFERENCE, 1894.

"On the other hand, a Chicagoan would have to be in full training, and at his very best, to attempt to do any boasting about his city politics. Indeed, he knows very well that when compared with the government of any but American cities, the government of his city, like that of so many other cities of his country, is simply a deep disgrace to Republican institutions and to the great Democratic idea."

FRANKLIN MACVEAGH, Chicago, Ill.

"It is no exaggeration of language to say that saloons and gambling houses and brothels are here nurseries for 'statesmen,' that the active hospitality of their keepers is, if not fatal, at least a grave impediment, to success in public life; and that men and women who gain their living by habitually breaking the laws have a potent voice in selecting the public servants, who make, interpret and execute those laws."

CHARLES J. BONAPARTE, Baltimore, Md.

"It must be admitted, however, that there are public servants who are not burning with a desire to discharge their whole duty to their employers, and who have no wish to keep the channels of communication open between themselves and the respectable classes. Their tastes and ambitions will lead them in other directions. They have great faith in the power of the corrupt and disorderly elements of the population, and their closest alliances are with those who represent these elements. Under management of officials of this class, conditions have been established in many of our municipal governments, which are far from satisfactory. Unbusiness-like methods of administration have crept in; illicit relations with contractors and plunderers of all sorts have been formed; a thousand subterranean openings into the treasury have been discovered; the guardians of the peace are seen to be on the best terms with several classes of prosperous law breakers; many officials are using the patronage of their offices with small regard for the interest of the city, but with a constant reference to their own political fortunes. There are honest men in the government, but they find it difficult to resist the rapacious and anarchical tendencies. When any such state of things exist, it is difficult for individuals to bring any effective saving influence to bear upon the city government. The task is one that requires the united and sustained efforts of many good men."

REV. WASHINGTON GLADDEN, D. D., Columbus, Ohio.

"There is no province where the American people need education more to-day than in the province of Municipal Government.

"But the governments of our great cities for the last thirty years have been our despair—Republican Philadelphia as bad as Democratic New York, Baltimore as bad as Chicago. The character of the men at the head of our city governments, our mayors and aldermen and common councils, has startlingly deteriorated. The proudest of American cities

must blush when it thinks who the men are in its common council, controlling its high interests, disbursing its millions of money, and representing its corporate life, when compared with the class of citizens who sit in the town councils of Birmingham and Glasgow and the great cities of France and Germany. In almost everything that touches municipal administration we are to-day behind Europe. We have everything to learn and almost nothing to teach. It is, I say, disgraceful and humiliating." EDWIN D. MEAD, Boston, Mass.

"First—That we must keep more constantly before the people the perils to which we are exposed, and the menace to the safety of our free institutions, because of the corrupt governments of most of our large cities. In the light of the present day, was not Wendell Phillips right when he prophesied that the correct solution of the problem of our great cities would test our free institutions more severely than our struggle with human slavery?

"We all know that the cities are growing out of all proportion to the country districts. It is one of the phenomena of this century the world over. At the present rate of increase the cities will control this nation in 1920. Do we want these great cities, as at present governed, to hold this power?" SAMUEL B. CAPEN, Boston, Mass.

"The officials of our great cities are not elected, nor their affairs managed for the benefit of the members of the corporation, but to reward men for, and to encourage them in, holding or gaining the local votes to swell the majority of one or the other of the great national parties, which have no more interest in or concern with the good government of a city than a mob with the good management of a bank which it loots and plunders for purposes of its own."

JOHN A. BUTLER, Milwaukee, Wis.

CLEVELAND CONFERENCE, 1895.

"The city of Indianapolis has had its share in emphasizing the failure of American municipal government. What with boodle aldermen, boodle councilmen and a loose financial system, with police and fire departments worth in votes to the party in control many times the number of employes, with a street department honeycombed with private and party snaps, boss-ridden, party-ridden, and nearly wrecked by its servants, the city had all the decorations which entitled it to a place in the front rank of civic failures."

LUCIUS B. SWIFT, Indianapolis, Ind.

"We have our machine; our political bosses; some unworthy men in office; the self-seeking contractor; the dishonest officer of election; the spoil seekers in legion.

"The spoils system is the one great octopus which is strangling virtue, truth and honesty in public life. The weapon of destruction that

must be used is the search-light of public opinion, blinding and destroying the evils which follow the creed that 'to the victor belongs the spoils;' that dishonesty is legitimate in politics; that the political party a man belongs to must be his infallible guide in municipal politics; that a public trust is no trust; that the political boss is *the* boss and that his mandate is the law, the right to the contrary notwithstanding."

FRANK N. HARTWELL, Louisville, Ky.

"All municipal offices are held by ward bosses or their followers, and their success so intoxicated them that hardly were they well seated before they commenced their carnival of plunder and corruption. The men composing this administration were mainly of small means, and some of the councilmen were dependent upon their daily toil for their support, but, notwithstanding their salaries were meagre, or nothing at all, it was not long before they took on an air of prosperity, ceased to labor at their usual vocations, and waxed mightily in the goods of this world.

"In the department of public works, for instance, at the present time the inspectors and ward foremen almost equal in number the laborers they superintend. To recite the progress of the present administration is but to recount the sacrifice of the city's best interest, and the complete prostitution, for personal and political ends, by its officers of their official powers. No private individual could obtain the most paltry privilege without being subjected to corrupt demands, and unless he complied, his request was promptly refused. The lesson taught the people by this administration has proven a most profitable one, and will, it is hoped, help to bring about the end of boss rule in this city."

WALTER B. SPENCER, New Orleans, La.

"The investigations of the Committee of One Hundred have conclusively demonstrated that the first evil tendency of personal greed as opposed to the public welfare, instead of being sternly checked in this city of Portland, has been actually encouraged by its political managers. If a contractor voted his men aright work was given him liberally and the pay was prompt and excessive. Honest performance of the work itself was, however, a matter of little consequence. Miles upon miles of defective sewers and streets bear eloquent witness to the evil effects of political control in business matters. The contractor and the city officer felt their first duty was to further each other's selfish interests, and contractors and officers cannot well serve two masters.

"From the far West we send you greeting. Our city is no worse, is perhaps better, than some of yours, but our cause is a common one, and until our municipalities are honestly and economically managed upon business principles, the war both in the East and in the West should neither falter nor fail." THOMAS N. STRONG, Portland, Oregon.

"The board of public works consists of three members. Under the original charter this was simply a supervisory board, the various

branches of the city work being under the charge of separate superintendents. As usual in large cities, this department was for a time the chief center of jobbery and intrigue in the city's affairs. Appointments on the board were sought and used for political ends, and its patronage was used to promote the political fortunes of its own members or their political backers." EDWARD O. GRAVES, Seattle, Wash.

"It is, therefore, exceedingly unfortunate that a very large proportion of our office-seekers are unfit or unworthy to fill the places they contend for.

"Men of character and ability are repelled by the conditions imposed or the services expected by those who control the nominations. Men who lead or belong to the vicious or predatory classes are eager and persistent in their efforts to secure the positions which enable them to increase their power, or to defraud and oppress the people by such methods as those which have been so thoroughly exposed by the Lexow Committee in New York." CHARLES RICHARDSON, Philadelphia, Pa.

BALTIMORE CONFERENCE, 1896.

"In the first place we had everywhere enormous taxation, a taxation which produced a revenue sufficient, if it were honestly and wisely applied, to furnish every city in the land with every possible comfort and convenience, and even to adorn them with the triumphs of architecture and art. But all this was, in great part, misapplied; and the consequence was we had very little return for it. Our streets were miserably paved and everywhere in a filthy condition. The schools were poor; the police was corrupt from top to bottom, and in collusion with evil-doers. All departments of government were affected by the demoralization, and the official force, from the mayor down, in our principal cities, was of a character which we could not exhibit in the face of the world without a feeling of disgrace. These were the consequences which flowed from this demoralization." JAMES C. CARTER, New York City.

"I cannot here attempt to describe at any length the rise and rule of the despotic oligarchy which for twenty years dominated political life in this city and our state, ground down our people, endeavored to crush our independence, cheated us of our suffrage and ate up our substance." CHARLES MORRIS HOWARD, Baltimore, Md.

"Our municipal condition, however, is far from satisfactory. Our administration is neither judicious nor economical. Questions of appropriation do not receive mature deliberation, results in nearly all departments are not the best of their kind, and the disposition of the Council has been, and now is, to exceed annually the current revenues of the city." VIRGINIUS NEWTON, Richmond, Va.

"The interests of the people must be conducted by those who are entrusted to manage them, with the same wise, careful and conservative

judgment that a competent business man should use in the transaction of his own affairs." A. V. S. LINDSLEY, Nashville, Tenn.

"The abuses of administration were retrenched by law; the heads of departments had just been re-elected for four years; the ring organization was perfect in every detail; its members were held together by the cohesive force of public plunder, and its managers had ample sources on which to draw for all the money which might be needed for any purpose, and had the influence which flows from the absolute power to distribute the public patronage, franchises and improvements; and it was supported by thousands of voters who were dependent on city work and knew that active, willing and efficient service was the price they must pay for the opportunity to earn a living for themselves and families." GEORGE W. GUTHRIE, Pittsburg, Pa.

"The development of an active, intelligent, civic spirit, the practical exclusion of the most ignorant and purchasable classes from the lists of voters, and the absence of political influences in the matter of appointments, in foreign cities, are in brilliant contrast with our deficiencies in these respects." CHARLES RICHARDSON, Philadelphia, Pa.

Under the conditions disclosed by the foregoing extracts, extracts, too, from American citizens, is it not strange that men will be found who will advocate enlarging the opportunities and powers of our city governments? Surely no business man would advocate it. On the contrary, he would have our municipalities conduct the business in hand in the same manner as the same business could be conducted by private enterprise before he would approve enlarging their powers and opportunities.

But the theorist says, enlarge the responsibilities of the government and you will improve it. Acting upon that theory the doors of every house of correction and penitentiary in the land should be opened, and every evil-doer therein sent back to the community whence he came. He should then be restored to his former position in the community, and instead of looking after his conduct and affairs more closely, he should be given *carte blanche* to do as he may wish.

OWNERSHIP AND OPERATION ABROAD.

According to the Returns of Street and Road Tramways to Parliament, July, 1896, there were 153 distinct street railway undertakings in Great Britain and Ireland, subdivided as follows:

Number of companies owned and operated by private capital.....	116
Number of undertakings where tracks are constructed by the municipalities and leased to private parties	31
Number of undertakings owned and operated by the municipalities	6
	153

The six cities are as follows:

	Population.	Miles of Track.
Glasgow and suburbs	840,000	73
Leeds	400,000	27
Sheffield	380,000	19
Huddersfield	100,000	21
Plymouth	90,000	5
Blackpool	35,000	5
		150

GLASGOW.

Of the above cities Glasgow is the only one wherein the undertaking may fairly be called successful; and with reasonable economy it could not well be otherwise than financially successful. For a population of over 800,000 Glasgow has only 73 miles of tracks, whereas St. Louis, with a population of less than 700,000, has over 335 miles of tracks. It does not follow, therefore, that if the government of St. Louis was conducted equally as well as the government of Glasgow, that it could also operate the street railway system of that city successfully from a financial standpoint.

It is well to remember, however, that Glasgow boasts of a "continuity of existence of over nine centuries." We may, therefore, safely place it within the limits of possibility that when our American cities survive a "continuity of existence of over nine centuries," that they may be so far advanced in methods and morals that they, too, may be intrusted with additional power and responsibilities.

LEEDS.

The city of Leeds had operated its street car system for nearly three years. The first year showed net earnings of approximately $15,000, less than 1 per cent. upon the capital invested, whereas private capital earned and paid 7 per cent. the previous year. The second year showed net profit of $35,000, not quite the interest upon the sinking fund. And such results, too, with a population of nearly 15,000 per mile of track.

SHEFFIELD.

Previous to the acquisition of the street railway by the municipality, July, 1896, private capital received from 5 to 8 per cent. dividends from the operation of the property. Under municipal management there was a loss the first year, the road not even earning the interest upon the capital invested. And such results in a city which has over 17,000 persons per mile of track!

HUDDERSFIELD.

This is the first city in England to attempt the operation of its street railway, and for the fourteen years which it has operated the property there is a loss of $311,000, varying from $3,300 to $83,000 in a single year.

This loss has been met by drawing $105,000 from depreciation account and the balance by taxation, varying from one-ninth of a penny to five pence, per pound. It may seem strange that the municipality should thus continue to operate under such conditions. The fact is that Huddersfield is a manufacturing city and the non-property and small tax-paying voters are in a majority.

PLYMOUTH.

In the last fiscal year there was a loss of $5,430. This city did not acquire the property voluntarily. On the contrary, the operating company intentionally forfeited its charter and abandoned the operation of its cars.

BLACKPOOL.

This operation shows a net profit for four years of $992, after paying interest and charging off to depreciation.

And yet in Plymouth, Huddersfield, Sheffield and other cities in England, boys of from fourteen to sixteen years of age, receiving $2.50 per week, are employed as conductors. Notwithstanding such conditions some of those cities have not earned the interest upon the capital invested. Does any one suppose that American cities, if operating street railways, could employ such conductors at such rate of wages?

In Germany there are only three cities which own and operate their street railway systems, and two which own the tracks and lease them to operating companies. In France there are none.

The facts, as they are before us are, that there are a few cities abroad, which own and operate their street railway systems with more or less indifferent results, and only one of which, viz., Glasgow, that can properly be called a financial success; and yet there are those who would have American cities, regardless of differences of conditions and institutions, plunge blindly into the acquisition and operation of 15,000 miles of street railway tracks because Glasgow operates 73 miles successfully.

It seems to me that those who honestly advocate the acquisition and operation of street railways by municipalities do not look below the surface. They find that an occasional city abroad does such things and they immediately jump to the conclusion that we should do likewise. They do not study the conditions with respect to accommodations furnished abroad, as compared with those in this country; the methods of administration there compared with those here, and the civil service abroad compared with ours.

DIFFERENCE IN CONDITION.

In a previous paragraph I showed the difference between St. Louis and Glasgow. On next page will be found a comparison of other cities of nearly the same population, taken from the *Yale Review*, for May, 1897.

	Population.	Area in sq. miles.	Street Railway Mileage.	Mileage per 1,000 of Population.	Mileage per sq. mile of Area.
Birmingham	497,000	20	33	.066	1.65
Boston	494,000	37	295	.597	8.00
Edinburgh	289,000	14	21	.072	1.50
Detroit	300,000	28	202	.673	7.21
Leeds	400,000	34	27	.067	0.79
Cleveland	350,000	32	205	.585	6.40
Liverpool	641,000	21	66	.103	3.14
St. Louis	644,000	62	216	.320	3.50
Manchester	530,000	20	54	.102	2.70
Baltimore	512,000	34	262	.511	7.70
Bradford	228,000	17	21	.091	1.23
New Orleans	250,000	40	169	.676	4.22
London	4,400,000	105	230	.052	2.19
New York	1,851,000	59	357	.203	6.05

Compare any one of the above foreign cities with an American city of the same population and you will find that the area of the latter is greater, and the street railway accommodations greater in proportion, than the former. The English cities average over 15,000 persons, and the American cities over 2,600, per mile of track. And yet there are those who would state that because Leeds could operate 27 miles of track successfully, that Cleveland, with nearly the same population and area, could also operate 205 miles of track, nearly nine times as many miles of track, also successfully. If, therefore, the methods of civil service and administration were the same in both cities, Leeds could be eminently successful and Cleveland a monumental failure.

COMPARISON OF ADMINISTRATION.

(City Government in the United States, by ALFRED R. CONKLING.)

"The Right Honorable Joseph Chamberlain, in an article on 'Municipal Institutions in America and England,' in the *Forum* for November, 1892, makes an interesting comparison between Birmingham (his residence) and Boston. He says the total annual municipal expenditure (excepting the appropriation for schools and almshouses) of Birmingham is but $1,665,000, while that of Boston is $10,194,000, or more than six times greater than the expenditure of Birmingham. The two cities have much in common. They have about the same population and both are large manufacturing towns.

"The public works of American cities are perhaps the field of more swindling than any other department of the municipality. Brooklyn furnished us with an object lesson. For example, the Commissioner of City Works finds nearly fifty sinecures in his department, and he has

begun by abolishing these offices, at a saving of $50,000 a year to the city. The result is that he has that additional sum to expend upon actual work for the welfare of the public. Fifty other idlers in his department are marked for early discharge; and the Commissioner of Public Parks has also dismissed seventy-five men whose only occupation was drawing a salary.

"The comparative cost of municipal government in Europe and America is easy to understand. Any person who inspects the annual budget of the chief cities of the Old and the New World will be startled at the economy of the one and the extravagance of the other.

FINANCIAL STATEMENT OF REPRESENTATIVE CITIES.

	Population.	Fiscal Year.	Net Indebtedness.	Per Capita Indebtedness.	Annual Interest Payment.	Annual Expenditure.	Per Capita Cost of Education.	Per Capita Annual Expendlture.
London.....	4,221,452	'90-91	$225,000,000	$53.29	$10,801,675	$54,601,965	$1.58	$12.93
Glasgow.....	782,728	'93-94	39,620,770	50.61	1,321,890	9,046,000	1.62	11.54
Birmingham.	429,906	'92-93	38,146,440	88.73	1,335,125	7,033,025	1.45	16.36
Berlin.....	1,579,244	'92-93	68,275,000	43.23	2,450,000	29,915,950	2.16	18.31
New York ...	1,515,301	'94	101,428,481	66.93	4,889,383	37,362,065	3.04	24.65
Chicago.	1,438,010	'94	17,722,950	12.32	851,421	32,020,184	4.24	22.26
Boston.....	494,205	'95	37,131,423	75.13	2,443,716	22,099,543	5.09	44.71

"The average per capita expenditure of the foreign cities above mentioned was $14.79; of the American cities, $30.54.

"The new Mayor of Chicago (1894) has said that the greatest danger of cities is that of being robbed by their own officials, in the sense of being burdened with expensive and superfluous office-holders. In one month he directed the city treasurer to reduce his salary ten per cent. and transfer it to the general fund.

"A law was passed in 1883 to build a new aqueduct from the Croton River watershed to the city of New York. This stupendous public work became a harvest for politicians; large sums of money have been squandered upon it, and much of the work had to be done over. The defective work was, in part, owing to corrupt inspectors and engineers, who approved work that was not only contrary to specifications, but done in a most scandalous manner.

"The public works of American cities are, perhaps, the field of more swindling than any other department of the municipality. Mr. White, in his suggestive article in the *Forum* for December, 1890, says, 'The city halls . . . are the acknowleged centers of the vilest corruption.' In that connection this remark applied chiefly to the aldermen, and, occasionally, to the Mayor. But the public works that are controlled by the officials in the city halls of the larger towns are generally as badly and corruptly done as the proceedings of the city legislature. I could give many examples, but I shall simply remind the reader of the 'Tweed' courthouse in the city of New York, which cost untold millions, and the

new city hall of Philadelphia. The visitor to the Quaker City is at once struck with the prominence of this public building. The gigantic tower is a monument to the extravagance and corruption that formerly existed in the city government.

"Unfortunately, the inspectors of public works in large cities are often political appointees out of a job. They must be taken care of by the ring, and are put upon the pay-rolls to the detriment of the citizens. Their salaries are so low, and their 'assessments' or contributions to the ring so large, that they are often forced to approve of defective public work, or blackmail the contractors of private dwellings, in order to support themselves and their families. These inspectors learn from their superiors lessons in the practice of blackmail. Their political employer or overseer has probably extorted money from the contractors on public and private buildings, so he is not surprised when his clerks and underlings in turn pursue the same practice. These inspectors show discretion in levying tribute on citizens.

"In the cities of Europe millions have been spent on the quays and docks. Take, for example, the magnificent Victoria Embankment on the Thames at London, the quays of the Seine at Paris, and the embankment on the Neva at St. Petersburg. Few American cities have been willing to improve the water-fronts properly. If our water-fronts were improved, economically and carefully, it would meet with the general approval of the intelligent citizen, but so many large cities are cursed with ring rule that the suggestion of a general system of stone embankments and docks (either on bays or rivers), arouses universal objection and indignation.

"Several years ago a dishonest contractor was constructing a sewer near Central Park in New York. He was in great haste to obtain his money, and, instead of using pipes, he laid barrels in the ground, for which he received the contract price.

"As I write, municipal officers of all grades in many of the large cities are now under indictment, and many more would be added to the list if it were not for corrupt police magistrates, packed grand juries and negligent attorneys."

MUNICIPAL REFORM IN THE UNITED STATES.

(By Thomas C. Devlin.)

"The Science of Municipal Government in this country is crude. Our methods are expensive and our governments inefficient. The burden has become oppressive, and nearly every city in the land is making some efforts for reform, and there are no cities where the same are not necessary.

"That there are able and well-meaning men in all those reform movements no one will question, but there are also 'sore-head' politicians who nourish the rancor of defeat, and hair-brained theorists who have never had one practical thought in matters of personal interest.

"In summing up the short-comings of American cities it has been very easy to make comparisons with European cities and to suggest the adoption of the same principles of government and methods of administration under which those cities have been made models for efficiency and economy. It is, however, the opinion of those who have studied most carefully the municipal problem in the United States that no material aid can be had from the adoption of European methods in matters of city government.

"The matter of franchises is one of the most distinguishing features between American and European city governments, and which in a measure renders the adoption of European methods impracticable. All the powers of government in Europe are in the hands of the property-owning class. In Germany the three-class system of voting, while affording the masses a pretense of power, gives to the wealthier classes absolute control of municipal affairs.

"A study of the franchise in American cities shows that the non-taxpaying voters are a large majority. Taking Boston, for instance, the registered vote of Boston in 1892 was 73,000. There were 32,407 taxpayers, of whom 3,200 were women having no vote, and about 700 aliens or non-residents. Deducting the taxpayers who are not voters leaves 28,507 as the number of property-holding votes out of a registered vote of 73,000. If every taxpaying voter voted, this shows the non-property vote at 46,693 against a property vote of 28,507.

"It is said that cities are business concerns in which every taxpayer holds an interest, and there is a persistent demand that its affairs shall be conducted on business principles. Then it seems not unfair that representation in the city should be limited, as in a business corporation, to the stockholders, if the same results are desired. If this hypothesis is correct, we must admit that no business would succeed under management similar to the cities.

"It is also true that the ignorant, vagrant and purchasable element comes almost wholly from the non-taxpaying class, and their only interest in an election is the price they may receive for their votes. They are an element of especial solicitude to the ward politician, and are often the decisive power in partisan contests. Indeed it may be further said, that integrity, honor and ability will never prevail, in city councils particularly, until the candidates may safely disregard the demands of the worst elements of society and know that their election depends upon citizens who hold those virtues to be their chief qualifications.

"Every large city is practically in control of the non-taxpaying element, and from this class the intemperate, vicious and purchasable vote is mostly composed, and it is through his influence with them, and his ability to handle them, that the ward politician secures his own election, and achieves success for, and standing with, his party. He is often one of this party, which he controls, and, if not, affiliates with them, which amounts to the same thing.

"He extends to them so far as he can, the same patronage which he and his colleagues in other wards have received from higher authority. He promises the creations of new offices, clerkships in others, and jobs in parks and streets without number, and thus crowds every department of the public service with incompetency and unworthiness, which would never be tolerated in any private enterprise. Through all the avenues of patronage he looks forward to paying campaign obligations and of maintaining his prestige with the party. Surely the alliance of the business of cities with national politics, and its control by the party machine, is a serious evil. It opens the way for every form of dishonesty and mismanagement which avarice and ambition can suggest.

"The power of the legislature to meddle in city affairs is corrupting, both to the legislature and the city. The city 'Professionals' will be in attendance at each session of the legislature, and when the city charter is acted upon, or special acts concerning the city are passed, they will be marked by their cunning and avarice. The Hon. Seth Low tells us that in every year of his term of office he was compelled to oppose at Albany, the seat of the State Legislature, legislation seeking to make an increase in the pay of policemen and firemen, without any reference to the financial ability of the city or the other demands upon the city for the expenditure of money. . . . New and useless offices were sought to be created, and the mayor found that not the least important of his duties, as mayor, was to protect the city from unwise and adverse legislation on the part of the state.

"Edward W. Bemis, writing in *Public Opinion*, says: 'A recent chief of the Chicago Sanitary Department assured the writer that there were not six of his hundred subordinates whom he could trust. It was useless to dismiss any one for the chief must take in his place whomsoever some alderman may desire. Not infrequently new offices, with chiefs and many deputies, are created for no real purpose other than the positions they offer. The pay is often out of all reason for the service rendered, but it is expecting too much of human nature to hope for any change while the system which makes it possible prevails. To cut off the salaries or positions of one's friends, who labored during the long siege of an election campaign, requires a degree of courage and ingratitude not attainable by the average councilman.'

"Francis G. Peabody, in comparing municipal service in the United States with service in the cities of Germany, says: 'With us municipal offices are the spoils of successful politicians; in Germany they are the prizes of experts. It seems to a German as incredible to hear of a city governed by men who are just pausing on their way to some higher place, as it would to hear of a railroad or of a cotton mill thus superintended. Good city administration with us is an accident.'"

The advocates of municipal ownership point with pride to the Postal Service of the United States, and would have us infer that in all things

the national and municipal governments could do likewise. In this they speak as partisans, yet we should not deny them such comfort as they may get. They do not refer to the annual pension appropriation, now $150,000,000 per annum, nor to the fact that the late General Grant and the late General Garfield, both good authorities, stated that $40,000,000 would be amply sufficient. They do not refer to the River and Harbor Appropriations, of which the late President Arthur wrote in one of his veto messages, "as the measure (River and Harbor Bill) became more objectionable it would secure more support." They do not refer to the National Government's experience in Union Pacific or to the experience of the State of New York in the Erie Canal.

STATE OWNERSHIP OF RAILROADS.

The experience of France and Brazil with government ownership of railroads is not encouraging to the advocates of the idea that railroads should belong to the people at large, and should be operated by officers appointed by the government. The South American Republic has determined to abandon state ownership of railroads, after a thorough test of the theory, and is now negotiating with European capitalists for a lease of the entire system, comprising 14,000 miles of track. When Brazil took charge of the Central Railroad, that corporation had paid as high as nine per cent. dividends, but under government control it has not only failed to earn its expenses, but has cost the people $2,000,000 or $3,000,000 a year above its receipts.

The experiment of state ownership of railroads has been tried longer in France than in Brazil, and under more favorable conditions. The model road there runs through well-populated districts, with large cities as terminals, but the results in France are discouraging. Eighteen years ago a railroad system was constructed, which was to furnish cheap rates for passengers, cheap freight for shippers, and abundant profits for the State. It has done none of these things. At first, the advocates of the enterprise insisted that only time was required to prove the wisdom of the project. Eighteen years have passed and the results may be briefly summarized. Theoretic methods have been abandoned, and the railroad is now managed substantially as are those in the hands of private capitalists, except that its tariff of rates is a little higher, and its cost of operation is considerably larger. The last report shows that the net return on the whole capital expended is one and thirty-five-hundredths per cent., and even the State cannot borrow money for less than three per cent. The government has every year a considerable deficiency to settle, and the people who use the line pay somewhat more than they would have done if the enterprise had been left to private capital.

Canada has had an experience of state ownership also, but upon a more limited scale. There the government owns about ten per cent. of the whole, upon which it loses about $500,000 annually.

The railroads and their equipments and fares of France and Germany, operated by the government, cannot be compared with those of England, operated by private capital; and the manufacture of tobacco and cigars by the government of France has produced such vile stuff as to be an object lesson to enthusiasts of government monopoly.

PUBLIC OWNERSHIP AND PRIVATE OPERATION.

Some of the advocates of changing the present state of things stop short at the operation of street railways by the municipalities, and advocate that the municipalities own the tracks and lease them to private capital. They are aware of the present condition of our administrations and dare not go the logical length of their position. If our municipalities are so unbusinesslike and corrupt in their methods as to be incapable of operating a street railway property, then they are also unfit to manage the construction of the property and to make contracts for its use. You cannot stop half way.

The motive for public ownership abroad is twofold. The first has reference to the conditions of the streets and street surface. They have as a rule finely constructed and maintained streets, and in their very proper regard for keeping them so, they desire to control all construction and maintenance of tracks. The second has reference to controlling and regulating the method of operation. That has proven a failure, and can be accomplished better when granting a franchise. In nearly every case in England where the municipality acquired the operation of the property it did so involuntarily.

The city of Toronto, Canada, is the only instance in this country of public ownership and private operation. The conditions and contract there please the theorists and the street railway company, and all are happy. While I am neither a prophet nor a son of one, I will state that in my opinion before the contract period shall have expired, Toronto will have cause to regret that it adopted some English methods under almost American conditions. The municipality constructs the concrete bed for the tracks, supplies and does all paving, and removes all plowed snow. The compensation which it receives per mile of track is much less than what is paid in some states by one company for running over the tracks of another company. Percentage of receipts, rates of fare, etc., should be looked upon as nothing more nor less than a premium for which the operating company receives a monopoly. Competition and the fear of it are completely shut out. Single fare and transfer carry a passenger only to the suburbs. Those going to and from the suburbs pay extra fares, and as the city grows in population it will become as congested as foreign cities, or the people will be compelled to pay extra fares to get to and from suburban homes. Such conditions exist nowhere in the United States.

The conditions with respect to Toronto and its suburbs suggest a practical problem in the United States should municipalities desire to

acquire street railway properties. Abroad street railway systems are usually operated within the limits of the municipality, as at Toronto. Should the systems be extended further, additional fares are charged. In the United States, on the contrary, in nearly every instance the street railway system extends beyond the city or town limits and usually only a single fare is charged. Should a city obtain the street railway system within its own jurisdiction an interesting problem is opened up with respect to the owner of the balance of the property; and in case the balance of the property should be acquired by the other towns through which the system may be operated, a question arises as to divisions of "spoils," profits and losses. It may result as it did in Birmingham, England, in the price of gas. That city provides its own gas and charges suburban towns fifty per cent. more than it charges its city consumers.

Respectfully submitted,

P. F. SULLIVAN.

THE PRESIDENT—Gentlemen, you have heard the paper prepared by Mr. Sullivan. We would like to know if there are any questions to be asked concerning it, or any discussion to be had upon it.

MR. HEIDELBERG, Chicago—Mr. President, on account of the lateness of the hour, I move that the next paper be put off until the first thing to-morrow morning.

THE PRESIDENT—Mr. Heidelberg, we have to get through with the business we came here for. We cannot neglect our business. I will, of course, entertain the motion, if it is seconded, but will argue against its adoption. We came here to attend to business; let us attend to it first.

The motion was not seconded.

THE PRESIDENT—You have heard the paper by Mr. Sullivan. What action will you take?

MR. BEAN, St. Joseph—Mr. President, I move that a vote of thanks be extended to Mr. Sullivan for his able paper, and that the same be spread upon the minutes of this meeting. Carried.

THE PRESIDENT—If there is no discussion on this paper, we will now proceed to the next paper, which is, "Some of the Difficulties Existing in the Construction and Operation of Electric Street Railways," by Mr. G. W. Knox, Electrical Engineer, Chicago City Railway Co., Chicago, Ill.

REPORT OF THE COMMITTEE ON "SOME OF THE DIFFICULTIES EXISTING IN THE CONSTRUCTION AND OPERATION OF ELECTRIC STREET RAILWAYS."

MR. KNOX read the paper, as follows:

Mr. President and Gentlemen:—With the smaller street railways during the panic period, which it is to be hoped we are about emerging from, it has been a struggle for existence, and a road that has pulled through these times without running behind, may be considered fortunate.

The railway management has often during these times been called upon to make a good showing in dividends, having at the same time a decrease in earnings to contend with. How to do this has been a most perplexing problem for many a street railway manager, and by his not being equal to the emergency, has resulted in there now being a long list of roads in the hands of receivers.

I do not charge up to the stock manipulators or the hard times all the crime of the necessity for receiverships of these railways. Many an electric road now in the hands of a receiver could be making neat incomes for the investors, had a closer study and practice of the economic principles governing the details of construction and operation been made, and thereby done away with the many wasteful measures which are sapping the very life out of what might have been paying investments. The keynote of this does not lie altogether in the ability to make any one or two large reductions or savings, but rather in lopping off, here and there, the many unnecessary extravagances existing in the various departments of the system.

The first and most important step in working out economies, is in selecting a corps of operators from the head foreman down to the man sweeping out the depot. If they are interested and are working for the good of the company, scarcely an hour of the time in which they are engaged can go by without their effecting little savings, which in time swell the item of economies to mammoth proportions.

Examples of how this is done are very numerous. For instance: Had a certain motorman been the man for the position and exercised more care in operating his car, he could perhaps have averted an expensive accident case for his company. In a minor matter, an armature winder, by being interested and more painstaking in his work, could, by insulating an armature coil with perhaps the thirty-secondth of an inch more insulation, have saved a burn-out and an expense of twenty-five or thirty dollars. These are only examples of the many instances where a reduction in expense is made possible.

In considering the question of our engines and electrical machinery, we have reached a state of comparatively high efficiency and economy, and there is not the chance of making the saving on these lines, in either the designing or operation, that there has been in the past.

There is also but little chance, in a broad sense, for argument upon questions such as feeder requirements, the necessity of ample and absolute return, cars, motors, etc., as a general idea of what is required is so well understood that these problems narrow down to a study of how to accommodate the conditions as found, which the man in charge should be fully able to meet.

In the management of railway work, the greatest opportunities for economy will be found in the *details* of construction and operation.

It is totally out of the question for anyone to lay down a code of rules to be followed, owing to the varying conditions. The success attained in both construction and operation depends wholly upon the practical knowledge of the man in charge of the work. What is greatly needed by those directly in charge of the equipment and operation of electric railways, is a better opportunity for meeting each other to discuss matters of detail in construction and operation.

One of the mistakes into which we are most liable to fall is the rut of self-satisfaction with our own style of work. Then it is that the manifestations of decay and inefficiency begin. Those who are most satisfied with their own work are often those making the poorest showing. It is imperative, in order to eliminate the difficulties with which we meet, that we brush up against the other fellow, and get *his* ideas. To be better able to do this, the plan now adopted by the electric railway companies of several States, of having State meetings for the discussion of plans for better methods of carrying on the work, should be made general. There are a few of these State organizations for the purposes mentioned, but there are not enough of them. The American Street Railway Association, has, I believe, too much of a national character to afford the time to take up and discuss the details of which construction work is principally composed.

To these State meetings, the companies should send the men at the heads of the different departments, for which all concerned would be well repaid by the benefits derived therefrom. By keeping a man isolated, back in some dingy old shop or barn, he cannot be expected to be bristling with the bright ideas that bring forth the efficient service which characterizes the "other fellow's road," and makes it a good dividend payer.

Following up the idea that it is the first wrong step that counts, our whole aim must necessarily be to make as few mistakes in the construction as possible, for it is an easily demonstrated fact that the cost of operation depends largely upon the methods of construction.

It is an absolute necessity that we look ahead and plan against all kinds of speculative disaster, ignoring, if you please, in this case, the teaching that "we should not cross the bridge until we come to it." A little foresight which results in preventing an accident, will probably mean the saving of the profits for many days' operation; one of the examples being, with ordinary conditions in the installation of overhead

work, the use of but one insulation between positive and negative. For the first year or so, this will be found sufficient, but a little later on the insulation begins to deteriorate, and there follows frequent short circuits and burn-outs, which stop traffic and entail an expense many times the cost of two additional insulations, which would insure to a reasonable extent against such leakages and burn-outs.

It is not fair to the owners of a majority of the electric railway properties to say that they have worked on the retrenchment idea as regards expense in putting in the system. They have been universally liberal with their money; but where they are to be censured is in the fact that they have not familiarized themselves more fully concerning the methods of installation. They have been inclined to leave the question entirely to the honesty of the contractor or supervising engineer, who was not necessarily dishonest, but a man who knew a good thing when he ran across it, and perhaps slighted the work accordingly.

Among the most important matters to study connected with construction and operation to insure economy is the supply department. There is an immense sum of money needlessly squandered in a year in supplies and repairs for an electric road. One of the causes of this waste lies in the fact that the roads have not yet arrived at a standard in the design of the apparatus which they use, to which too much importance cannot be attached. Every road should be its own designer of all articles used, for why should the manufacturer be better able to determine what is required than you are? You are on your own ground, know exactly the conditions to be met, and are in constant touch with the difficulties as they arise, and are far better able to devise the remedies than is the manufacturer miles away, who perhaps has only his own experiments and a confusion of theoretical speculations to rely upon.

I mean in no wise to decry the assiduous and most excellent work of the manufacturers of electrical apparatus. It was and is a field of necessary inventive development, and the manufacturers are sparing no effort or expense in their endeavors to supply the trade with the improvements in demand, but the unwary railway man has had an immense amount of experimental claptrap machinery inflicted upon him, all of which has cost dearly, and which is still maintained at a sacrifice. It is a lamentable fact that we have not done more than we have towards correcting this evil.

Along this line is another evil, for which the railway man in his efforts to save money is in part accountable, in the shaving of prices on material to such an extent that it has resulted in competition being so sharp among the manufacturers of electrical supplies that they have adopted the piece-work plan in order that cheapness may be secured, thus turning out upon the market apparatus that is not gotten out for efficiency, but to fill orders. Of course, these articles may have been

built according to specifications, and stood the shop test, but there is demonstrated an entirely different proposition when this apparatus is put into actual use; it is *then* that we see the bad effects of the hurried and slighted work of the piece-workers.

To free ourselves of these troubles, we must be more careful in getting out the specifications and checking up the material received. The most carefully prepared specifications in detail should go out for every piece of apparatus used. You will then find that your supplies are coming to you made up in the proper manner, your supply-man knowing that should he send out a mixed up and defective lot of material, it will be promptly returned to him with charges "collect."

To be able to get out the specifications needed requires a certain amount of experimental work, and how far to go with this experimenting, is a problem requiring the keenest discretion. Experimental work should only be encouraged and allowed by a company to the extent of having in view the elimination of an existing money-wasting evil. The testing, making of new designs and patterns, with perhaps the subsequent throwing in the scrap heap of the article gotten out to conform to some pet theory, when kept track of, is found to be a tremendous waste of money.

Experimental work should, however, be encouraged as far as it is profitable in the way of stimulating sagaciousness and promoting adaptability on the part of the men handling the work, but all experiments should be allowed only as passed upon by the management of the road, which should be fully competent to determine the probable practicability of the theory proposed.

In making up and buying supply parts one of the factors of economy lies in the bulk to be used. Of course the greater the amount purchased the greater the saving. I would, though, strongly advocate not getting too great a quantity of any kind of material on hand, as the defects developing often require the complete changing of designs, with consequent scrapping of all material in stock.

Another serious difficulty to be considered in connection with operation is the inefficiency of the motormen. I concur with a railway manager who once said: "Motormen, like poets, are born, not made." There are motormen who will operate a car day after day, year in and year out, without the slightest accident or complaint, while others are constantly having wrecks and their cars are always being run in the depot out of order.

In the calling of a good motorman we have a position with more responsibility attached, perhaps, than the position of an engineer of a steam railroad. A motorman, of course, has not in trust property that has the value of a steam railway train, but his field of operation lies where there is greater menace to life and property (for which his employer is responsible in case of injuries), than with a steam railway engineer. A trustworthy motorman should be required to pass a

physical examination, possess a cool, collective temperament, judgment as to cause and effect of things in general, and have a fair amount of mechanical ability. He should be obliged to undergo the most strict examination as to his fitness in these requirements, and in addition be thoroughly conversant with the correct method and rules of how to handle the equipment.

The Board of Examiners for the fitness of employes on street railways will be able to make a better showing in efficient operation than most other departments, by giving more attention to the examination and instruction of operators, and that there is needed improvement in this particular is evinced by the magnitude of the accident account, which is due mostly to the operators not being properly schooled in the work they are handling.

I do not believe in attempting to educate motormen to any extent in electrical knowledge, as it has been proven that it is a waste of time and nothing is accomplished by it. Giving them an insight into, and encouraging them in determining the cause and remedy of some electrical trouble with which they may meet on their cars while on the road, you have men with all kinds of theories, wasting the company's time in tearing apart and dissecting the equipment, and perhaps then not locating the trouble, and at the same time they are undoubtedly blocking the line. If, after failing with the simpler methods of locating the trouble, they had called for an emergency crew, or been pushed into the depot, they would have been doing much better service. There are, of course, some cases where it is excusable for men to attempt to locate trouble on their cars, but, as a rule, it is found to be the wrong practice. If they understand the brake mechanism, the proper manner of applying the power to their motors, how to cut out a disabled motor, and the rules as given in the rule books, they will have about all they are able to master.

A good, bright, interested motorman or other operator on the system, upon noticing anything wrong with the equipment, should be educated in, and made to feel that it is his first duty to report everything coming under his observation that is working to the detriment of his company, and he should have this so impressed upon him that he will feel uneasy about his position until he does so.

It may be asked, what is to be done with employes in cases of carelessness and consequent losses through their actions? Of course, it is out of the question to always avert accidents or mishaps, and specific rules cannot be laid down defining what is to be done in handling every case, other than by saying, it depends mostly upon our ability to get the right kind of men, and to instruct and impress upon them that the burden of preventing such losses rests entirely with them. It is well to remember in discipling men for offenses or carelessness in their work that if they have clean records in the way of good intentions, they should be given another chance; as they will, in all probability, improve

as a result of their experience and make valuable employes for the company.

In placing a man in charge of work or a department he should be given the full responsibility of his position; then he will take an interest in what he is doing, have a little company of his own, so to speak, wherein he tries to save the dollars to the extent that he would were they his own. That is the way he should feel and act, and if he does not, his place cannot be filled too quickly. A company should, however, be governed with all cautiousness in making changes with heads of departments, also operators in general. A man assuming a new position usually comes loaded down with fertile ideas. They may have fitted perfectly the conditions existing in his former location, and believing that it is a poor rule which does not always work, he immediately proceeds to put his ideas into effect. Some of them may be good, but, as a whole, by the time he has tried all of them, the company is, in the long run, unless heretofore there existed a deplorable state of affairs, liable to lose money by his practices.

I know of an excellent piece of railway property which should be paying good dividends. The company was born at a time when the experimental stage in electrical apparatus was well under way, thus enabling the selection of a fairly first-class equipment. They spent plenty of money on their installation, but as soon as the road was equipped the practice of changing management every three or six months was adopted. This resulted finally in their having about every style of apparatus. One of the managers came to the conclusion that he could make money by scrapping a style of motor he found on the road, so back in the corner they went. When his six months had expired, and the other fellow came on, he said he could make those motors go all right by changing their windings and otherwise fixing them up, and they were dug out of the scrap pile, the rust scraped off, new windings of field and armature substituted and the motors are now in operation. *This practice costs money.* There is nothing at all strange that this road should be struggling along for existence in the hands of a receiver, and I will not believe that overstocking, or the hard times, had all to do with its being in this position.

As a rule, the general condition of affairs out on the line and in the depots and stations of street railways, is in a much shabbier state than exists in other lines of business. This is partially on account of the apparatus used being out in the middle of the street, or back, may be, in an old dark barn, where no one really expects to see good order and cleanliness prevail; but it is a most serious mistake to allow this state of affairs to exist. Besides being directly wasteful of itself, it has the effect on every man connected with the company of making him generally careless and neglectful in his work. Out on the line it breeds contempt, in the public eye, for the whole system, and will act as a barrier to getting further concessions for lines. I can call to mind a repair

depot, where the floor of the shop part is as clean as the floor of a Dutch kitchen, the walls and ceilings are neatly whitewashed, and there is an individual place for every repair part used—from the cotter pin of the trolley wheel to the truck wheels of the car. Any repairman could be blindfolded in this depot, and yet he would be able to go and get any article of repair needed. There is no time lost in pulling out and hauling over material to find what is wanted. The results obtained by reason of these practices are highly profitable, and wonderfully gratifying to the management; in point of neatness of cars, a minimum in the number of car trouble reports and amount of material used in repairs, while the car expense per day is no greater, and in most cases less, than that of other depots working under like conditions.

Much valuable time is lost and money thrown away by roads which are keeping so many records on matters pertaining to operation. Where a few records may be gotten out with a view of demonstrating that a leak is going on in some line of the work, or for the purpose of comparison in spurring some of the departments up when they are inclined to be negligent, there is, of course, money in it, and in fact it is necessary in order that the work may be handled intelligently, but where you have your men spending their time in keeping track of how long a certain armature ran, the length of time it takes to make repairs of a certain part of the motor, etc., which records are rarely referred to, and should one want to use them it would be necessary to spend as much time in looking them up for use as it originally took to get them out—is all a waste of time and money.

The man in charge of a department should be able, when called upon, to show exactly what it is costing to perform any part of the work under his charge, but he should be able to have this knowledge without the constant keeping of a lot of records.

One of the most commendable practices employed in the maintenance of a street railway, is the regular calling together of the heads of the different departments for consultation on matters pertaining to their respective departments. The details and new complications constantly coming up concerning the work are so varied and numerous, and the men actually handling the work have such an excellent opportunity of observing and dealing successfully with the difficulties arising, that their reports at once place the situation of affairs panoramically before the management for action. Some serious trouble with the equipment or operation may be going on; some one man, perhaps, has a way of remedying the difficulty which the others had not thought of, and again, practices that are extravagant may come to light during these meetings, so that those who have not tried this plan will find it a most valuable adjunct in methods of operation.

The subjects mentioned are, I know, being constantly thought about and worked upon by all street railway men, and are well understood by them, but there is no denying the fact that there exists with us in our

work at times, an unjustifiable and inexcusable amount of carelessness which results in the property depreciating as a money earner to the extent that the holders of street railway securities become disgusted, withdraw their holdings, the receiver is appointed, and the road is branded as a failure.

The way of preventing the most of these cases rests with the men who are actually handling the equipment in assisting the management in keeping down expenses. How far this is accomplished resolves itself into the extent to which we go in getting the most practical men, who will be able to adapt themselves to and handle efficiently the conditions existing in their respective lines of work; and there must be constant vigilance on the part of heads of departments in taking advantage of the advancements being made and in thoroughly and constantly checking every man and his work.

Respectfully submitted,

GEORGE W. KNOX.

THE PRESIDENT—Gentlemen, you have heard the paper presented to you by Mr. Knox. We should be glad to have some discussion on it.

MR. LITTELL, Buffalo—I move that the paper be received and spread upon the minutes and that a vote of thanks be returned to Mr. Knox for presenting the valuable paper.

THE PRESIDENT—I think Mr. Knox also deserves thanks for being present and presenting his paper. It is my opinion that the selection of a man to present a paper before this Association, which gives him an opportunity (especially if he is a young man and is not known, except in his own city and amongst his own people, with whom he is thrown in contact) to become known all over the country, and to meet men who come from every section, ought to be appreciated so much that he would take the pains and trouble, recognizing the compliment of the selection, to prepare a paper and come here and read it, and Mr. Knox deserves great credit for having taken that trouble, and I am glad that he has done so.

MR. LITTELL—My motion will not dispose of the paper. I do not mean to take it from before the meeting, so that it cannot be discussed.

THE PRESIDENT—It is understood, I believe, that Mr. Littell's motion is to extend a vote of thanks to Mr. Knox for writing the paper and presenting it here.

The motion of Mr. Littell was put and carried.

Mr. Heidelberg, Chicago—When I made a motion to adjourn a short while ago, I did not make it with the intention of calling time. I arise now to apologize. Mr. Knox is the electrical engineer of our company. I observed, just as the paper was about to be read, that many gentlemen left the hall, and I desired to have Mr. Knox's paper held over until to-morrow morning, so that there would be a larger attendance to hear it.

Mr. Littell, Buffalo—I think the paper just read commends itself to every street railway man, be he president, general manager, superintendent, electrician, or whatever his position may be. It is a paper that every one should read carefully and study carefully. It has many important points, especially the one in reference to buying the supplies, and not buying too large quantities. Also as to calling the heads of departments together. Our road has practiced that for a good many years, and we have a school every morning, and not only talk over matters, but discuss them, and it is attended with a great deal of good to the company. It is a great benefit to the company and consequently to the public. I think this paper should be given a great deal of consideration.

The President read the programme of entertainment provided for the afternoon and evening by the local committee.

On motion, the meeting adjourned until Wednesday morning.

WEDNESDAY'S SESSION.

President McCulloch called the meeting to order at 10:30 a. m.

The President—The first business this morning will be the report of the Auditing Committee on the report of the Treasurer.

REPORT OF THE AUDITING COMMITTEE.

MR. SERGEANT, Boston—Mr. President and gentlemen : I beg to say that we have examined the accounts, and we have affixed to the report of the Treasurer the following certificate:

"We have examined the cash account of T. C. Penington, Treasurer, and find the same supported by proper vouchers and correct.

C. S. SERGEANT,
D. B. DYER,
Auditing Committee."

NIAGARA FALLS, Oct. 20th, 1897.

MR. BEAN, St. Joseph—I move that the report be received, approved and spread upon the minutes. Carried.

THE PRESIDENT—Is there anything of a general nature to be brought before the meeting this morning before we proceed to the reading of the papers? If not, the first paper to be presented will be that on the "Application of the Storage Battery to Electric Traction," by Mr. Charles Hewitt, Electrical Engineer, Union Traction Company, Philadelphia, Pa.

REPORT OF THE COMMITTEE ON "APPLICATION OF STORAGE BATTERY TO ELECTRIC TRACTION."

MR. HEWITT read the paper, as follows:

Mr. President and Gentlemen :—To give a history of the application of the storage battery to electric traction would only be turning over dry bones. The long series of remarkable failures is no doubt familiar to you all. To say that the storage battery has no place in electric traction is an error, and, on the other hand, to say that it will supplant all other means of applying power to the cars is, I believe, only the dream of the enthusiast. We are sufficiently acquainted with the possibilities and limitations of the storage battery to-day to be able to make installations whose success will be certain; improvements in manufacture have certainly been made in the past few years, but the cause of past failures has been due quite as much to errors in installing and in manipulation as in manufacture.

In preparing this paper I have made an effort to obtain accurate information from parties in Germany, France and England, but all such attempts have been of no avail. As far, therefore, as the state of the art in Europe is concerned, we must rely on what we have been able to gather from current literature.

The most important applications of the Storage Battery to electric traction are:

1st—The application of the battery direct to car or locomotive.

2d—The application of the battery at points on the line distant from the generating station.

3d—The application of the battery in the power house.

THE APPLICATION OF THE BATTERY DIRECT TO CAR OR LOCOMOTIVE.

We are led to consider this form of application, first, not on account of its successes, but rather on account of its conspicuous failures. From our investigation we can see nothing in this form of installation to commend, except for certain local conditions, which are peculiar to the large cities on the Continent of Europe.

The first cost is greater than our present overhead form of construction, and the expense of operation is considerably greater; in fact, it is doubtful whether the expense of operation can be brought below that of horses. It is less reliable, and more objectionable to passengers on account of the gas given off. But very little reliable data is obtainable from all the various experiments which have been made. Most all such experiments, in this country at least, have been made by the battery manufacturers, and the results obtained have been most carefully guarded. Mr. Dawson, in an article published in *Engineering*, October 16th, 1896, says: "Two principal causes have so far prevented the successful use of accumulator cars—their great weight and rapid deterioration of plant. Owing to these causes, the manufacturers of storage batteries only have seriously taken up accumulator traction, and although they have been working on the problem since 1880, little reliable information has ever reached the public."

In a paper read by me before the Engineers' Club, of Philadelphia, December 5th, 1896, I gave in detail the results of a test made by me of a certain battery car. The main results agreed quite closely with data which has come to us through European publications, and I feel confident in stating that the battery car requires considerably more power to operate than an ordinary trolley car of the same size and under the same conditions, and further, the battery car will require a larger investment in generating machinery. The unreliability of the battery car, and the disadvantages due to the necessity of constantly changing the batteries are familiar to you all, and we have no facts which would warrant us in holding out any hope of improvement in this line.

When the action of the battery is thoroughly understood it is not difficult to understand the cause of failure. Every battery has what may be termed a critical rate of discharge. From zero up to the critical rate the working e. m. f. remains practically constant. Above the critical rate the e. m. f. decreases as the rate of discharge increases. On the other hand, the e. m. f. increases with the rate of charge and the length of charge. For any particular battery there is a rate of charge which cannot be exceeded without useless waste of energy. In Fig. 1, I have shown typical curves for charge and discharge at normal

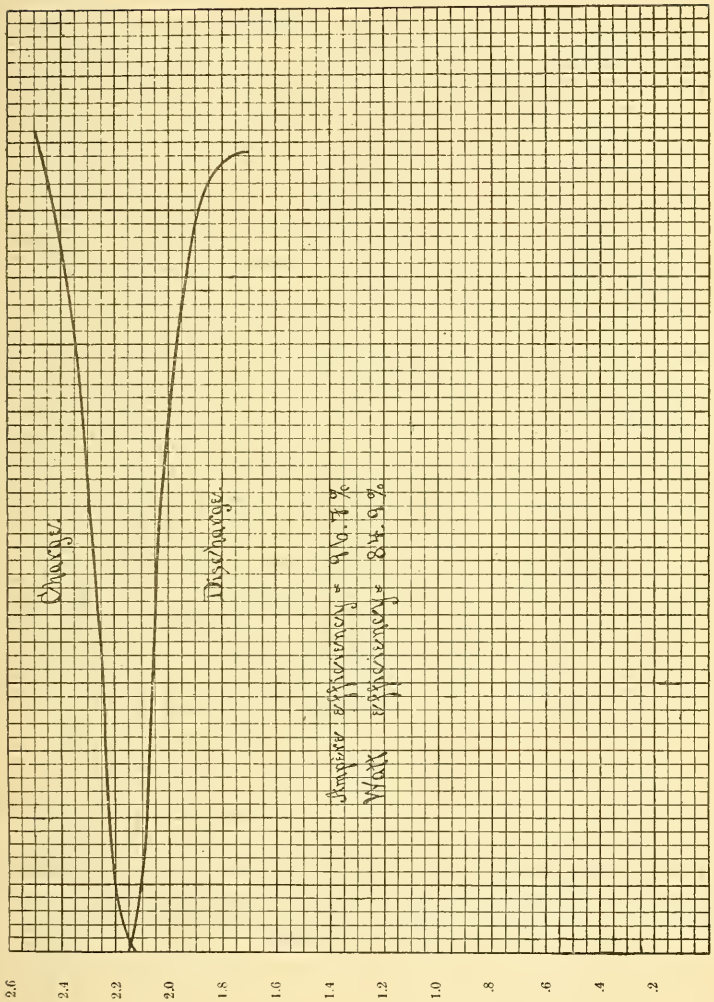

Charge
Discharge
Watt hours per pound of positive plate = 4.6 %
Watt hours per pound of negative plate = 4.6 %
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 Hours.
2.6 2.4 2.2 2.0 1.8 1.6 1.4 1.2 1.0 .8 .6 .4 .2

FIG. 1.—CHARGE AND DISCHARGE CURVES.

or critical rates and the portion between the curves represents lost energy. In Fig. 2, I have shown the discharge curve taken from a traction battery test. With a fairly constant discharge at the average rate used by the car, with rests of one minute every fifteen minutes, the fall of e. m. f. is very marked. You will appreciate, therefore, the remark of Sir David Salomon, "that it takes power to get current through the battery, and it also takes power to get the current out." These critical rates of charge and discharge seem to be partly due to the time required for the chemical reactions in the battery to take place. The physical limitations of a car require the battery to have a

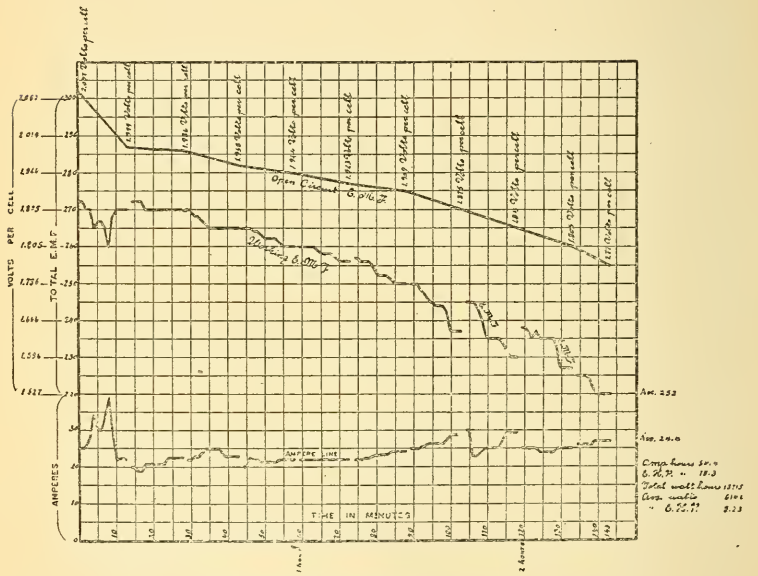


FIG. 2.—BATTERY DISCHARGE THROUGH RHEOSTAT.

large output for its weight and bulk. To obtain this it is necessary to increase the surface of active material as much as possible and to decrease the inactive supporting grid. In consequence, the battery plates become mechanically weak. The conditions seem to prevent the making of plates large enough to prevent exceeding the critical discharge rate, and which are at the same time light enough and small enough to be carried on a car. The inherent characteristics of the lead battery are such that it is very doubtful whether it will ever be successful in propelling cars unaided by other sources of power. Great results are expected from the experiments now being made in Chicago; but great results have been expected before and I do not look for results in

Chicago much different from those that have preceded. It is claimed that the batteries in use in Chicago will show a much longer life than any that have as yet been tried. But even if the life of the plate were all that could be desired, we would not feel warranted in recommending the system.

MR. HEWITT, speaking—Since writing this paper, I have received information from reliable authorities that the results in Chicago are far ahead of anything that has taken place heretofore.

There is another phase of this method of application which is used somewhat extensively in Europe. In some of the larger cities on the Continent there is a prescribed area within which overhead lines are not allowed to be erected. To overcome this difficulty the cars are supplied with batteries sufficiently large to propel them at a low rate of speed for a distance of three or four miles from the point where the overhead line ends, into the city and return. While the cars are completing the trip the batteries are charged from the overhead wire. I am sure such an arrangement would not commend itself to any practical railroad manager, except as a make-shift in such government-ridden cities as exist in Europe. There are only two cities in this country where such an arrangement might reasonably be considered, and in those cities the slotted conduit has (and I believe wisely) been adopted.

The advantages of this method are apparent. Aside from the lack of overhead lines in the crowded city center, which is purely aesthetic, the most marked advantage is the lack of necessity for changing the batteries for charging. But this advantage is offset by the fact that as the charging is done *en route* the current for charging must be transmitted over the feed wires in addition to the current necessary for propelling the car with its extra weight of battery, thus increasing the loss due to charging. The power transmitted may be divided as follows:

1st—To propel the car without battery.
2d—For propelling extra weight of battery.
3d—For charging battery.

I regret that I have been unable to get accurate data showing the relation of these items to each other. But I feel satisfied that the extra cost of feeder cables due to the extra power transmitted and the decrease in efficiency will more than offset any saving in cost of linework, while the cost of operation must be, and is acknowledged to be, in excess of the less complicated system in common use in this country. The fact that overhead lines are in use up to the prescribed limit and that the battery is only used where it is compulsory speaks volumes. It is also significant that the commissions appointed by the larger roads in England and Scotland to investigate the various methods of traction in vogue throughout Europe and America have vetoed any form of battery car.

The following data is taken from the writings of Mr. Dawson and others :

COMPARATIVE DATA OF ACCUMULATOR CARS.

	PARIS Lead	BERLIN Lead	WIEN Cop. Zinc
Passengers carried	50	31	32
Empty car weight in pounds	18,081	19,845	16,097
Loaded " " " "	25,799	24,630	21,036
Weight of cells	3,749	7,270	3,969
Number of cells	56	88	136
Capacity of cells in ampere hours	230	130	300
Power per car mile required at power house in Board of Trade units	1.120	1.072	1.280

DATA OF ACCUMULATOR CARS RUNNING IN PARIS.

Number of cells	108
Number of plates per cell	11
Size of plates, in inches	7⅞ x 7⅞
Thickness of negative plate, in inches	.236
Thickness of positive plate, in inches	.315
Weight of plates, in pounds	39.69
Capacity in ampere hours	250
Efficiency per cent	70
Average discharge rate	35
Maximum discharge rate	100--120
Life of negative plate, in car miles	93,750
Life of positive plate, in car miles	8,750
Passengers carried	50
Weight of loaded car, in pounds	30,870
Weight of cells, in pounds	6,615

DATA OF ACCUMULATOR LINE AT THE HAGUE, 1891—JULIEN ACCUMULATORS.

Length of line	3.5 miles
Maximum grade	1.50
Weight of car, loaded	14 to 16 tons
Number of cells	192
Weight of cells	4 tons
Maximum speed in miles per hour	12.5
Maximum distance run with one charge	44 miles
Average " " " " "	35 "
Capacity of cells in ampere hours per lb. of plate	4.5
Positive plate can run without renewal	9,000 to 11,000 miles
Cost of maintenance of cells, per car mile	8.5*d*
Cost of handling cells, per car mile	2.3*d*
Board of Trade units consumed, per car mile	1.080
Probable maximum discharge rate	130 amperes

COST OF RUNNING ACCUMULATOR CARS IN BIRMINGHAM, ENGLAND, PER CAR MILE IN 1893.

Wages	3.37	pence	6.74	cents
Fuel	1.76	"	3.52	"
Stores	.68	"	1.36	"
Water and gas	.12	"	.24	"
Sundries	.17	"	.34	"
Repairs and maintenance	5.49	"	10.98	"
Total	11.59	"	23.18	"
Car miles run			140,993	

WORKING EXPENSES OF ACCUMULATOR TRACTION IN PARIS, PER CAR MILE, IN 1893.

General expenses	.204	pence	.408	cents
Cost of power	2.828	"	5.656	"
Maintenance and handling of accumulator	2.537	"	5.074	"
Motormen and assistants	1.210	"	2.420	"
Maintenance of motors and trucks	1.410	"	2.820	"
Heating, lighting and various	.138	"	.276	"
Total	8.327	"	16.654	"
Miles run			144,718	

COMPARATIVE COST OF VARIOUS SYSTEMS OF TRACTION IN PARIS, IN CENTS, PER CAR MILE.

Horses	17.10 cents
Accumulator	16.66 "
Hot water locomotives	10.78 "
Overhead trolley system	9.24 "

A third phase of the battery car system is the battery locomotive. Aside from special forms such as the Heilmann locomotive the one most worthy of mention is the experiment on the New York Elevated Railway, in which the battery is connected in multiple with the motors, and charges or discharges according to the demands of the train. When the demands of the motors is sufficient to lower the pressure on the line to or below that of the battery, the battery will then discharge into the motors, thus relieving the feeders. When current is shut off from the motors, the battery will charge. No results of this experiment have been made public yet, but it is difficult to see how much is to be expected. It has the advantage of maintaining a fairly constant pressure at the motors, but this can be accomplished better in other ways, as I shall show later. It subjects the battery to usage which history has proven to be disastrous to its life and efficiency. In this method the extra weight of the battery has the certain advantage of giving additional adhesion to the rails.

MR. HEWITT, speaking—I learned only last evening that this clause is apt to be misleading. The experiment was planned to be carried out on the lines which I have read, but the actual experiment was carried out in a different way. The battery, instead of being placed on a locomotive, was placed in the power house, and only a small battery placed on the locomotive, to carry it over some switches; so that, although this paragraph may appear in print, I wish to make that correction.

While not wishing to seem pessimistic, I must confess that to me the outlook for the battery car is not bright, and I do not look for much improvement unless some combination of elements be discovered whose characteristics are entirely different from the lead battery.

THE APPLICATION OF STORAGE BATTERIES ON THE ENDS OF LONG LINES.

In such applications the conditions are entirely different. The battery in this case acts essentially as a pressure regulator. The conditions do not restrict the size of the plates, so that the plates can admit of such a size that the current density on discharge can be kept well within the limits of normal discharge; and in consequence of this, the battery is not subject to the great loss of efficiency, due to the fall of e. m. f. on discharge.

Only a few such installations have been made, two of which are on the Isle of Man; one has been installed by the Anaconda Mining Company, at Butte, Montana. There is also a small plant at Merrill, Wis. The first installation, however, that has been made for any large city road for its suburban service, I find, is the one installed by the Union Traction Company, of Philadelphia, Pa.

The road was originally a horse car line, which ran as far as the depot at Pelham, a distance of 7.3 miles from the power house. Conduits and cables were installed for operating a number of cars which were supposed to be amply sufficient. The phenomenal increase in the travel, however, necessitated a large increase in the car service. In addition, the success of the line warranted its extension to Chestnut Hill, 2.3 miles further. More recently the line has been extended down a long grade to Hillcrest Avenue, and from Hillcrest Avenue to the Wheel Pump on the Bethlehem Pike, 1 6 miles further, making the end 11.2 miles from the power house. With the first extension of the line to Chestnut Hill, the underground cable was also extended, but the drop in pressure over this long line made it impossible to run the requisite number of cars, as the speed of a trolley car is approximately in the direct ratio to the applied e. m. f. The cables for feeding this section consisted of one cable extending to Chestnut Hill, one to Chalton

Avenue, and one to Wayne Junction, about five miles from the station. All these cables were 1,000,000 circular mills copper, rubber covered and leaded, laid in terra cotta ducts. The investment in feeders for this line had reached a point considerably above $100,000, not including the conduits. To have increased the cable system so as to have sup-

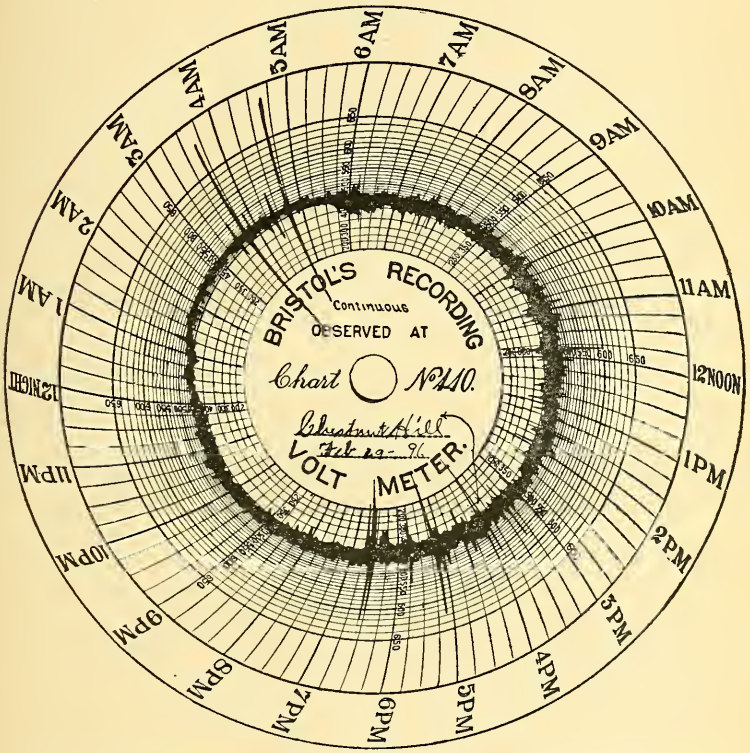


FIG. 3.—VOLT-METER CHART TAKEN AT CHESTNUT HILL BEFORE THE BATTERY WAS INSTALLED.

plied this section properly would have required about 336,000 feet of 1,000,000 circular mills cable. At $1.05 per foot laid, this would amount to $352,800. Deducting the value of cables which were already laid, and which are estimated at $79,000, we find that the extra cost for cables without conduits would have been $273,800, this figure being, of course, prohibitive.

In order that you may appreciate the condition of the line previous to the installation of the battery, I would call your attention to Fig. 3, which shows a recording volt-meter chart taken at Chestnut Hill, and to Fig. 4, which shows the pressure at station bus-bar on the same day. 350 volts was frequently touched. The average was a little over 400 volts with 530 at bus-bar. It was necessary, therefore, to furnish some

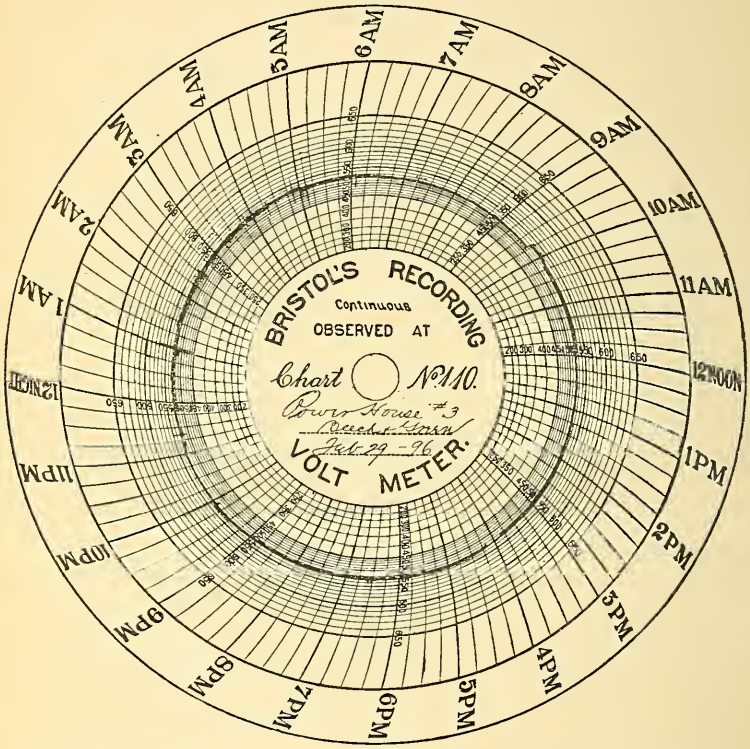


FIG. 4.—VOLT-METER CHART TAKEN AT BEECH AND GREEN STS. POWER HOUSE.

means of keeping up the pressure. If a station had been built at that point, it would of necessity have been small and inefficient. From records taken at the main power house, it was found that it would be necessary to provide a station of about 750 k. w. capacity. Such a station would have cost about $85 per h. p., or a total of $85,000. A battery station, on the other hand, required but little real estate, and

would be inexpensive to operate, and its cost would be considerably less than a power station. In the Chestnut Hill plant the entire cost of real estate, battery and building was approximately $25,000, and to this must be added the cost of a booster in the main power house. This required a 200 k. w. generator, which, with its engine, would cost about $8,000. The total cost of battery and booster would, therefore, have been $33,000. In this installation, however, they simply adapted a 300 k. w. generator at their power house to this service, so that they were put to but little extra expense in the power house for adapting it to booster purposes. We find, therefore, that deducting $33,000, the cost of the battery and booster, from $85,000, the cost of a station, that the difference in first cost is $52,000 in favor of the battery. In addition to this, they were put to an expense of a little over $13,000 for changes in the cable. In the estimates that follow I do not include any cost or interest on the cable, as the investment would have been about the same whether they had built a station or installed a battery. It is very

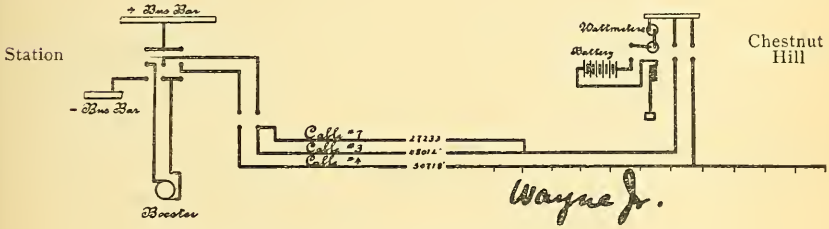


FIG. 5.—DIAGRAM OF CHESTNUT HILL CABLES.

apparent, therefore, from the facts given, that on the score of first cost, the battery was by far the cheapest installment which they could make. In order that you may better understand the results which I propose to give in reference to the operation of this battery, I beg to describe the plant somewhat more in detail.

You will see by Fig. 5 that there are three cables concerned in this work, which are numbered No. 3, No. 4, and No. 7, all of 1,000,000 circular mills capacity; the lengths of these cables being shown on the diagram. Cable No. 4 is the only one which supplies the trolley wire direct, or, in other words, all the taps from the underground cable to the trolley wire are tapped on cable No. 4; this cable running all the way from the bus-bar at the power house to the end of the line on the Reading Pike at Chestnut Hill. It feeds in all about twelve miles of trolley wire. Cable No. 3 runs direct from the power house to the bus-bar at the battery house, as shown in the diagram. Cable No. 7 simply augments the capacity of cable No. 3.

In ordinary operation the current on cable No. 3 passes through the booster at the power house, by which the initial pressure is raised 150 volts, more or less, above the ordinary bus-bar pressure of 550 volts (see Fig. 7.) By this means the drop in the cable is overcome, so that the pressure at the battery house can be adjusted to a point where the battery varies but little to either side of the zero point; or, in other words,

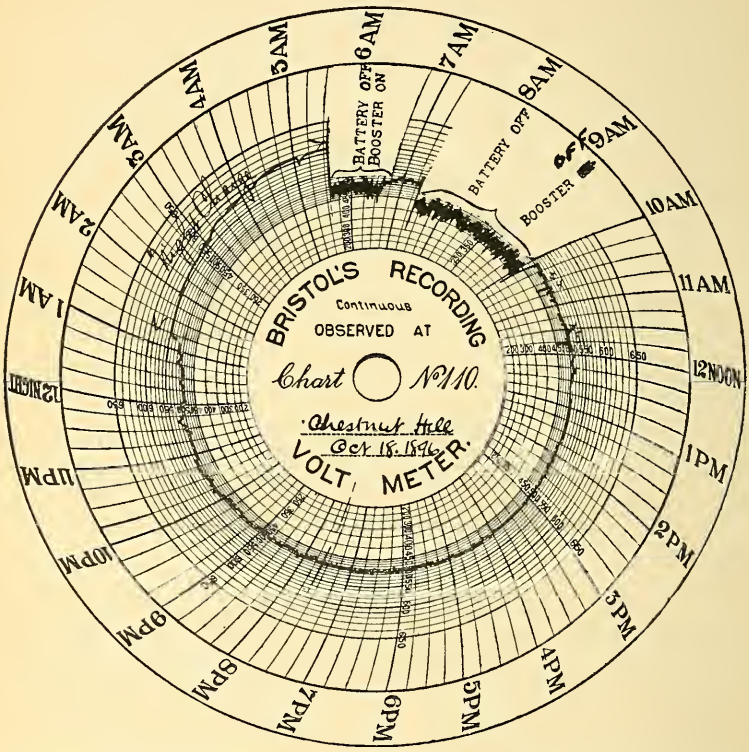


FIG. 6.—VOLT-METER CHART FROM BATTERY HOUSE AFTER THE BATTERY WAS INSTALLED.

it charges and discharges continually, maintaining the load on cable No. 3 nearly constant, and consequently maintaining a constant e. m. f., where the current passes out from the battery house through cable No. 4, as shown in Fig. 5. This cable (No. 4) is, therefore, fed from two points, namely: from the power house end at 550 volts and from the Chestnut Hill end at about 515 volts. As a consequence, the distri-

bution along the line from Wayne Junction to the end at Chestnut Hill is comparatively uniform, and is now very satisfactory.

At first the battery was allowed to discharge during the day about three times as much as it charged, making up the charge at night between the hours of 1 to 5. Later the amount of day discharge was decreased until the charge and discharge were about equal. The first gave a very even voltage of a little over 500. With the present method

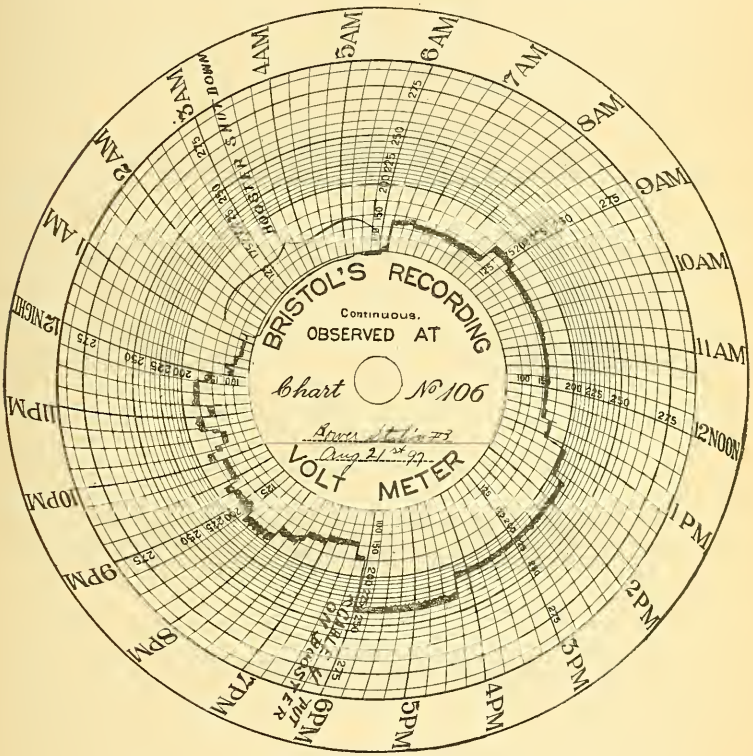


FIG. 7.—BOOSTER VOLT-METER CHART.

the voltage is somewhat more irregular, but the average is somewhat higher. By keeping the battery continually up to full charge, the night man has been dispensed with.

Fig. 6 is a copy of an average volt-meter chart after the battery was installed. When the load on the line is low, the current going over cable No. 3 to the battery house, divides at the bus-bar, one part supplying the necessities of the line, the other part charging the battery.

When the demand on the line is heavy, the pressure drops a little at the battery house ; all the current going over cable No. 3, passing out over cable No. 4, and in addition the battery will discharge sufficiently to make up for the extra demand for current. This has the effect, as I have stated above, of keeping an almost constant load on cable No. 3. At times the load on cable No. 3 has become so heavy as to exceed the cable's capacity. At such times by an arrangement of switches at the power house, shown in Fig. 5, cable No. 4 is put on the booster as well as cable No. 3. In doing this the current through the booster is largely increased, but the pressure can be reduced from about 250 to 125 or 130 volts (see Fig. 7), and, in addition, better pressure is obtained at the Wayne Junction end of the section.

COST OF OPERATING.

From volt and ampere meter readings taken from the power house in October, 1896, we find that 136,576,919 watt-hours were delivered to cable No. 3. By watt-meter records at the battery house 1,728,000 watt-hours were lost in the battery, leaving a difference of 134,848,919 watt-hours delivered to the line at the battery house. These figures, I may explain, do not include the watt-hours generated by the booster, since we have assumed that this entire amount is lost in transmission. As a matter of fact this is not strictly correct; but if a station were operated at Chestnut Hill, it would be run at a bus-bar pressure a little above the battery pressure, and, therefore, for our present purposes, the assumption is correct. From our experience in operating power houses of various capacities we find that a power house operated at Chestnut Hill under conditions which I have described would cost about 1½ cents per k. w. hour. We therefore get the following as the cost of generating the number of k. w. hours required by the Chestnut Hill branch during the month of October, 1896, if furnished by a station at Chestnut Hill.

134,848 k. w. hours at 1½ cents	$2,022.72
Interest on $85,000 at 5 per cent. per annum	354.17
Depreciation on machinery, etc., at 5 per cent. per annum	354.17
Insurance, taxes, etc	200.00
Total cost of operation for the month by direct method	$2,931.06

Actual cost of operating the battery and booster:

Watt hours delivered to cable No. 3 by bus-bar	136,576,919
Watt hours generated by booster	34,234,648
Total watt hours delivered to cable No. 3	170,811,567

The cost of operating the power house for the month of October, exclusive of interest and depreciation, was 7 mills per k. w. hour; therefore, we obtain the following:

170,811,567 k. w. hours at .7 cents	$1,195.68
Cost of labor and supplies at battery house	179.73
Total	$1,375.41
Depreciation of battery at 5 per cent. per annum	83.33
Interest at 5 per cent. per annum on $33,000	137.50
Taxes, insurance, etc	32.00
Total cost of operation	$1,628.24

Deducting this from the cost of operating by a station at Chestnut Hill, we find the difference in favor of the battery for the month would be $1,302.82.

Since October 1, 1896, the method of operating has been changed somewhat, and by installing watt-meters more accurate data have been obtained.

During the month of May, 1897,

There was delivered to cable No. 3 at 550 volts..	101,750,000	watt hours.
" " by booster	28,960,380	"
Total delivered at station	130,710,380	"
Total delivered at battery house	103,673,448	watt hours.
Less amount lost in battery	620,000	"
Total output at battery house to line	103,053,448	"

103,053,448 watt hours at 1½ cents per k. w.	$1,545.80
Interest on $85,000 at 5 per cent. per annum	354.17
Depreciation at 5 per cent. per annum	354.17
Insurance, taxes and miscellaneous	200.00
Total cost for May, 1897, by direct method	$2,454.14

Actual cost of operating battery:

130,710,380 watt hours at .6 cents per k. w	$ 784.26
Cost of labor and supplies	163.67
	$ 947.93
Depreciation of battery at 5 per cent. per annum	83.33
Interest at 5 per cent. per annum on $33,000	137.50
Taxes, insurance and miscellaneous	32 00
Total cost of operation	$1,200.76

NOTE.—Cost of operating power house for May, 1897, was 6 mills per k. w. hour. 5 per cent. depreciation of battery is amount guaranteed by makers.

Deducting $1,200.76, the actual cost of operating battery for May, 1897, from $2,454.14, the cost if station had been built at Chestnut Hill, we find a saving of $1,253.38 in favor of the battery.

We may safely say, therefore, that the saving by using the battery is about $1,250.00 per month or about $15,000 per year.

RECAPITULATION.

Saving in cost of installing battery over a new power station for Chestnut Hill	$52,000.00
Saving in operation per annum	15,000.00

These results speak for themselves, and need no further comment. The following data may also be of interest:

	October, 1896.	May, 1897.
Highest charge for 24 hours	456,000 watt hours.	300,000 watt hours
Lowest " " 24 "	312,000 "	150,000 "
Average " " 24 "	385,161 "	218,380 "
Highest discharge for 24 hrs.	456,000 "	250,000 "
Lowest " " 24 "	216,000 "	150,000 "
Average " " 24 "	329,419 "	198,380 "
Average efficiency for the month,	85.5 per cent.	90.8 per cent.
Average day charge in amperes	46	45.8 "
Average night " " "	155	.... "
Average discharge " "	50	43.7 "

Ratio of the night charge to the day charge ..... { Highest 4 to 1 / Lowest 1½ to 1 / Average 2.63 to 1

Ratio of day charge to discharge	October, 1896.	May, 1897.
Highest	1 to 4.45	1 to 1.5
Lowest	1 to 1.86	1 to .78
Average	1 to 2.95	1 to 1.10

SPECIFIC GRAVITY.

Maximum specific gravity at 6 A. M	1.210
Minimum " " " 6 "	1.2
Average " " " 6 "	1.207

The above are the specific gravities at the end of full charge.

Maximum specific gravity at 6 P. M.	1.201
Minimum " " " 6 "	1.184
Average " " " 6 "	1.192
Maximum " " " 12 "	1.194
Minimum " " " 12 "	1.182
Average " " " 12 "	1.188

At a specific gravity of 1.16 the battery would be about empty; so that we find at no time was the battery more than half discharged.

At the end of fifteen months of continuous operation, we have only had to repair two leaky tanks at an expense of about $25.00. The positive plates look as good as when first installed, and show no depreciation whatever; the negatives, on the other hand, have contracted somewhat and some of the plugs have cracked, but this in no way impairs their usefulness.

This method of power distribution cannot be considered economical *per se*, but where the conditions are such as we have described, there is no question as to economy in favor of the battery.

APPLICATION OF BATTERY TO POWER HOUSE.

This form of installation has not become very generally appreciated in this country, and but few installations have been made. As its advantages become better known, I feel confident the practice will become more general.

The wide fluctuations in load in railway power houses is now well known. The average daily load varies from 50 per cent. of the maximum in small stations to 70 per cent. of the maximum in the largest stations. From a very large number of observations in all parts of the country, I find that in the majority of stations the average load is very close to two-thirds of the maximum load. Now it is also a well-known fact that the maximum economy of the steam engine exists for a very small range of load, and that on each side of the point of maximum economy the efficiency falls off; rapidly on the overload, somewhat less rapidly on the underload. The result is apparent. In most stations the engines at the best have an average load of only two-thirds their most efficient load, and as a consequence consume over 4.5 lbs. of coal per k. w. hour.

With badly-regulated engines, and especially with water power plants, the changes in load are accompanied by variations in speed and consequently in voltage. These troubles may be entirely corrected by installing a battery.

The battery in this case becomes distinctly a load regulator. Figs. 8 and 9 show results obtained at Woonsocket, which is a water power plant. In Fig. 8 the load is carried entirely by the generators and, as is to be expected, the potential curve is very irregular, varying almost 100 volts, while the current varies from zero to 250 amperes. The action of the battery is shown in Fig. 9, where the generator load varies about 50 amperes and the potential curve is most regular. Fig. 10 shows the results obtained at Easton, Pa. In this case the battery is quite small and the advantage is not quite so marked as it would be if a larger battery were used. Instead of using four generators, however, they are able now to operate the same number of cars with three engines. No cost figures of these plants are made public, but the increased efficiency is apparent.

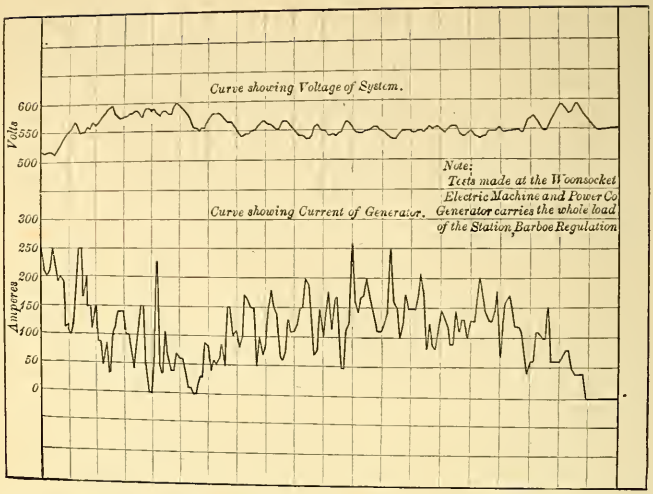


FIG. 8.—CURRENT AND PRESSURE CURVES AT WOONSOCKET BEFORE BATTERY WAS INSTALLED.

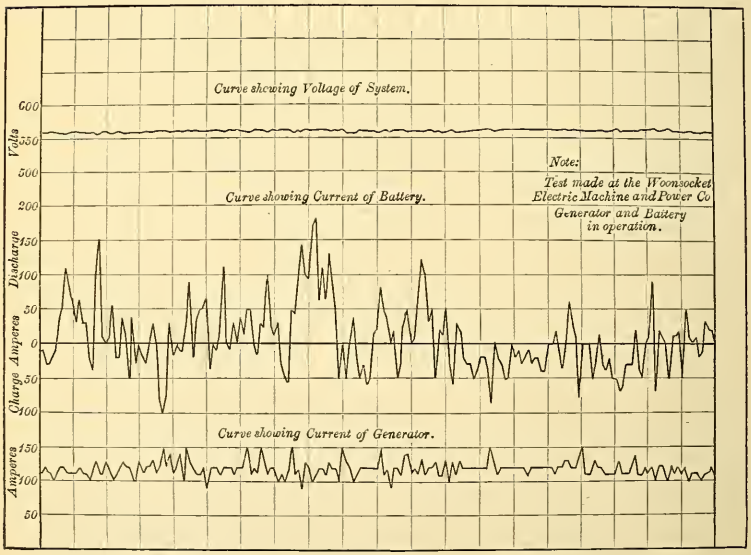


FIG. 9.—CURRENT AND PRESSURE CURVES AFTER BATTERY WAS INSTALLED AT WOONSOCKET.

It is necessary that the capacity of the battery should bear a larger ratio to the output of the station than is necessary for potential regulation as described in the previous section of this paper. In potential regulation a comparatively small battery is necessary, since by changing the potential of booster from time to time during the day the charge and discharge can be kept very low. In the case described a battery rated at 120 amperes has successfully regulated for a total output of 1,400 amperes. For load regulation, however, the battery should have a capacity equal to one-third the maximum output of the station. The

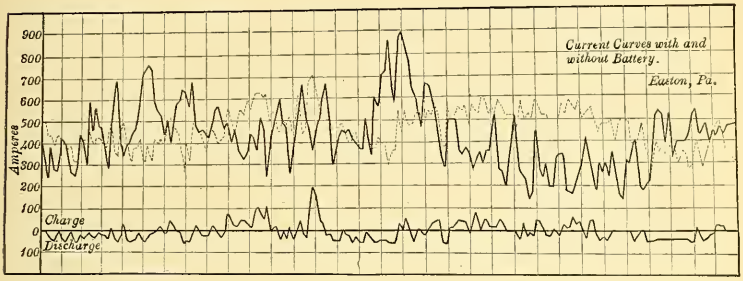


FIG. 10.—HEAVY LINE SHOWS OUTPUT OF (4) GENERATORS WITHOUT BATTERY. LIGHT LINE SHOWS OUTPUT OF (3) GENERATORS WITH BATTERY. EASTON TRACTION CO., EASTON, PA.

average load of the station may then be made the maximum load of the engines, the battery taking care of the fluctuations.

As in the previous case there are no physical limitations to be placed on the size of plates to be used and the charge and discharge may be kept well within the normal rates. Under such conditions the efficiency of the battery is high—85 to 90 per cent.—and the deterioration very low. In most cases no additional labor will be required.

Respectfully submitted,

CHARLES HEWITT.

DISCUSSION ON THE REPORT OF THE COMMITTEE ON "APPLICATION OF STORAGE BATTERY TO ELECTRIC TRACTION."

THE PRESIDENT—Gentlemen, you have heard Mr. Hewitt's excellent paper. We would like now to have some discussion on it. Any questions that you may ask Mr. Hewitt, he will be glad to answer.

MR. MCCORMACK, Brooklyn—Mr. Hewitt, I understood, stated that there were two cities in the United States where

a car storage battery would be applicable. I would ask what cities he referred to.

Mr. Hewitt—I have in mind the cities of New York and Washington. There may be other cities which would like to have that system, but these are the only two which need seriously consider the matter.

Mr. Bean, St. Joseph—I was much pleased with the word "aesthetic," when the gentleman said "aside from the lack of overhead lines in the crowded city center, which is purely aesthetic, the most marked advantage is the lack of the necessity for changing the batteries for charging." He implied in his answer to the question just asked that the cities named are aesthetic, and it is presumable that the balance are not aesthetic, and will use the trolley as described in his paper.

Mr. MacFayden, Chester—Do you recommend the storage battery in conjunction with the booster, in smaller stations, say with a capacity of from 900 to 1,500 amperes, or do you recommend the booster only?

Mr. Hewitt—From my observation I believe that all small stations would be benefited in a large measure in their economy, if they had a storage battery. Of course, the question of investment must be considered in all these cases; but as a general principle, the operation of the station would be economized, if the battery be used as an auxiliary.

Mr. MacFayden—What is the difference in the cost per kilowatt hour of the booster, independent of the storage battery.

Mr. Hewitt—The only case in which I have had personal experience is the one in Philadelphia. I assume the output of the booster to be the same as the general output of the station. We do not keep separate records of the cost of it, and it would be impossible to do so. The steam furnished for the booster engine is from the same source as the steam furnished for the other engines, and we could not separate them; but I have taken the cost of the station for the months described, and assumed that was the pro rata cost of the kilowatt hour generated by the booster.

MR. HARRINGTON, Camden—I ask Mr. Hewitt if the manufacturers of the battery installation have guaranteed the depreciation, and, if so, what the guarantee is?

MR. HEWITT—The storage battery people will guarantee the depreciation, and they have guaranteed the depreciation in our case. I believe it is for five or ten years, and at a certain rate pro rata to the cost of the battery. I do not feel at liberty to say just what the figure is. I do not think, however, that there is any special secret about it. Any man who wants to purchase a battery will get the information from a battery company.

MR. PATTERSON, Salt Lake City—Mr. President, I am very much interested in Mr. Hewitt's paper. It brings out some things that I have been thinking of along on this same line. We, in Salt Lake City, have a steam plant as well as a water-power plant, and we are now running our system by water-power eighteen miles from the city. We have occasionally, not often, been caused to shut down—once from a snow slide, which swept away the channel which we had around the mountain, and once from losing a bucket off the wheel. We still have our steam plant kept in good running order, but it takes from an hour to an hour and a half to steam up when these things occur. I was thinking, when listening to the paper being read, that it might be possible that we could operate a storage battery in connection with our plants. I would like to ask Mr. Hewitt if, in his opinion, we can have a storage battery, and if it would be a plausible scheme to turn the current after shutting down (we are at present, on average days, not counting the big days, running from 300 to 500 amperes), and run the plant by a battery; and, if so, at which end of the plant would it be best to put the battery? I presume, of course, at the transformer end.

MR. HEWITT—I think I am right in saying that the transmission referred to by the gentleman is an alternating-current transmission, and there are difficulties in working a storage battery in conjunction with an alternating current. For that reason it would be impracticable to put the battery at the generating end. To put it at the steam plant end,

which I presume is in the city, is simply a question of dollars and cents. A battery can be bought large enough to run any road in the United States, if you want to pay for it. It takes a pretty large battery to run the road, independent of all other sources, but it is simply a question of dollars and cents, entirely. In using the battery, in conjunction with other sources of power, as I have explained in the paper, you take up simply the fluctuations, and let the station do the main work; but to have a battery installation large enough to do the entire work, and make up the fluctuations as well, you would find it necessary to have a pretty large battery for any ordinary road, but it can be done, if you want to buy it.

Mr. MacFayden—Would you consider it economical to have the booster and the storage battery combined on a road, when you would only require the power during certain intervals, with heavy travel and on heavy grades? The reason I ask is that we have a booster on two of our divisions (which has been transformed into such from generators), and use them under such circumstances, with very good results, without the storage battery. Would it be better for us to have a storage battery in conjunction with our booster system, for such work as described? We can change our booster to a generator, without diminishing the horse power in our station.

Mr. Hewitt—In the case referred to at Chester, I do not think the battery would add to their economy. The battery, as a potential regulator on the end of a long line, becomes useful when the variations are so great that, in case of a sudden stopping of the cars, the potential would go so high as to do damage. For instance, at Chestnut Hill, on our plant there, we at times have the booster as high as 250 volts above the usual 550 volts, making 800 volts in all. If the cars should be stopped or blocked at any point, the potential would go very high, and become dangerous, and blow out the lights in the lamps, and cause damage to controllers, and other consequences would be sure to follow. The battery prevents the pressure going up in such cases.

In the case the gentleman has spoken of, where the potential does not have to be boosted so high as to be dangerous, and is only boosted at times of heavy load, when the potential on the end of the line is within safe limits, I do not think it would be economical to use a battery. The local conditions of every case must be considered in all such installations.

MR. MUNDY, Louisville—I desire to ask about the application of the battery, particularly in suburban work, such, for instance, as race-track travel, without the use of the booster. If the battery were mounted on flat cars, would it be practicable to run these cars out, in cases of special loads, to the end of the route, where you will have the load, and then, during the race or anything of that sort, the battery would be charged from your line, and at the instant of starting of the cars the discharge back into the line carrying you over the heavy peak? What do you think of this application? You could use that same battery, in times of long waits of that kind, by having a side-track at the station, and run it in to act as an auxiliary.

MR. HEWITT—That is one of the variations of the scheme used abroad, which is perfectly possible. It is a matter, of course, on which an opinion could hardly be given in an off-hand way such as this. It would have to be considered entirely with a view to the local conditions. The cost of the battery would have to be considered against the cost of putting up the necessary line work; and running cars under these conditions and the cost of maintaining the batteries would have to be considered as against the cost of running the cars in the other way. It might in some cases prove valuable, and it might in other cases prove very costly. I could not give an off-hand opinion or estimate at the present time.

MR. MUNDY—Which do you consider would be the more economical—the use of the battery or the use of the booster?

MR. HEWITT—I am hardly prepared to give a judgment in an off-hand way in a case like that.

MOTION TO ALLOW REPRESENTATIVES OF STORAGE BATTERY COMPANIES TO ADDRESS THE MEETING.

Mr. H. H. Littell, Buffalo—I am going to suggest that we hear from some of the gentlemen who sell storage batteries or accumulators on this subject, if it is admissible. We have with us in this room some storage battery men. These gentlemen are engaged in that business and are very well informed, and I think they could give the members of the Convention a great deal of information; and as there are so few storage battery or accumulator companies, I do not believe we would be showing any favor which others would take exception to. Now, if I am in order, I would move that the unanimous consent of the meeting be given to these gentlemen to make a few remarks and to answer any questions which may be put to them in reference to storage batteries or accumulators.

Mr. McCormack, Brooklyn—I think before this motion is voted on, the matter should be seriously considered. As I understand from some of the gentlemen present, this practice has always been excluded at past meetings.

The President—Mr. McCormack, if you will allow me a moment, I will say to Mr. Littell and the gentlemen present, that there is not one of us who does not feel very kindly towards the supplymen, and we want to give them all the opportunity we can to tell us what they have in a proper way; but we have scarcely had time at our previous meetings for the proper discussion of the papers presented by the members of the Association, and consequently the Association has excluded anything that might be considered in the nature of advertising a man's individual wares before the Convention. Unless you choose to second the motion, and have our past precedents set aside, the Chair will be obliged to rule against it.

Mr. Bean—I second the motion, with the understanding that each speaker be limited to ten minutes.

Mr. McCormack—Like most other men who come here, my time is limited, and the time of the meeting is limited,

and these papers are valuable. They are written by practical street railroad men. I for one can say conscientiously that when I attend these meetings I try to hear all the papers read. I also take all the advertisements of the supplymen, and when I get home I read them over. When I am down in the exhibition hall, I have them explain the different devices to me so that I can thoroughly understand them. I think the supplymen are to be commended upon the exhibits they make at these meetings, and particularly at this time, and I think the members will give the attention to the supplymen which they deserve in the exhibition hall—

The President—Please speak to the motion, Mr. McCormack—

Mr. McCormack—I simply desire to say that I think this motion is not only applicable to the question of storage batteries, but might be extended to nearly every exhibit, and I do not think we should give a privilege to one which cannot be extended to others.

Mr. H. H. Littell—I want to say a word on the general subject of storage batteries. This is the most important question, as far as dollars and cents are concerned, that has been brought before this meeting—the question of saving money. The gentleman talks of a saving of $33,000. It has been shown to us that we can save $75,000 yearly in our operation by the use of the storage battery, and I am almost led to believe that we can do it, but we have not made any contracts yet. I believe we ought to hear from all of the storage battery men. They have not asked me to make this request, and I have not talked with them on the subject. I believe we should give them an opportunity to say what they have to say. I ask that unanimous consent be given to the various representatives of the storage batteries to state the merits of their respective batteries.

Mr. Bean—I trust that this Convention will be courteous enough to allow these gentlemen ten minutes each to explain what they have. I agree that we are here mainly to hear papers read and to discuss them; but I think we can put that aside for a few minutes to hear from these gentle-

men on this important subject. We are here for dollars and cents; and this seems to be a matter which will save them, judging from what we have heard.

The question was put on the motion, which was lost by a largely preponderating vote in the negative.

THE PRESIDENT—The motion was for unanimous consent, so that it could not be adopted if there was objection.

DISCUSSION RESUMED ON THE REPORT OF THE COMMITTEE ON "APPLICATION OF STORAGE BATTERY TO ELECTRIC TRACTION."

MR. MUNDY, Louisville—I ask the question if it is practicable to construct these batteries so that you could handle them on the cars without drawing the liquid from the cells?

MR. H. H. LITTELL—That shows the necessity of hearing from the battery men. The battery Mr. Hewitt described does not go on the cars, and is not supposed to be put on the cars. It is an accumulator.

MR. MUNDY—I mean with reference to what I said a few minutes since, using it at the end of the line, if it could be handled in a car of that kind to stand jolting without spilling the liquid.

THE PRESIDENT—Are there any further remarks on this subject?

MR. WILSON, Sioux City—During the last few years a number of the smaller plants throughout the country—those which are operating a load from 300 to 1,000 amperes—have installed direct-connected units, a great many of them using compound engines. As Mr. Hewitt stated, these engines run at their highest efficiency only through a small range of the load. Now, in these smaller plants these engines run at very light load most of the time. Mr. Hewitt spoke, briefly I thought, of the application of storage batteries to stations for load regulation. I would ask him if he can say anything further on that point, and give some idea of what saving could be effected in stations of the size I have mentioned.

MR. HEWITT—I spoke briefly on that subject because there has been so little done in that line. If I had gone any further it would have been in the line of argument only, and I wanted to keep as close to the facts as possible. In the case at Easton it required four engines to run their cars. At the present time they run with three engines. That of itself shows that these three engines will run more economically than the four in the previous case, the number of cars remaining the same. The difference will be between the economy of an engine running at approximately its maximum economy and an engine running at a low economy. Just what the difference is at Easton I do not know, because I was unable to get the exact data, but it would probably be a difference of 25 per cent. in the coal. If an engine is running at a low economy, with 5 or 6 pounds of coal, at a low average load, and you increase the load to its maximum economy, you can probably reduce the coal per horse-power hour output down to 20 or 25 per cent.; but, in addition to that, you must deduct the loss in the battery itself, so that the net saving would possibly be 20 per cent. or thereabouts.

MR. HARRINGTON, Camden—I would inquire if there is any person present who has had experience upon the question which has been raised as to the matter of percentage of efficiency between running with or without the storage battery. It has been raised in our particular case, and just that one question is the hinging point, I think, more than anything else, to decide the question with us—just what saving would be effected, what the percentage would be. Mr. Hewitt thinks it would be about 20 per cent. If any of the Easton people are here they would probably know.

THE PRESIDENT—Is there any one present who has had experience which would enable him to answer the question just asked?

MR. ELY, Niagara Falls—I agree with Mr. Littell that this is probably the most important question coming before us, as it means, if successful, the saving of thousands of dollars, to say nothing of the cents. It seems to me that,

from our practice here, this is quite true. We are taking power for the Buffalo and Niagara Falls Railway, and the other street railways of Buffalo as well, from these large generating companies—the Niagara Falls Power Company and the Niagara Falls Hydraulic Power and Manufacturing Company. They generate the power and sell it to the street railway companies at so much per electrical horse-power per annum. You will see at a glance that the street railway company has to pay for that power, whether it is used or not, and for eight hours of the day, on an average, but a small quantity of the power will be used, and for a certain number of hours, on our line particularly, for four or five hours, no power whatever is being used; but we are paying all the time the fixed ratio for the entire amount of power. If the accumulator could be used to store the current, and we could use it at times when we might not take it from the power companies direct, it would be a saving to our companies of thousands of dollars per annum. In Mr. Littell's case it would be a great saving. His company is taking 1,000 horse-power daily, per annum, from this transmission line, and they are going to take more. Mr. Hewitt, in your judgment, as the result of your investigation, has the state of the art advanced to that degree that storage batteries or accumulators may now be safely, practicably and economically installed to meet such cases?

Mr. Hewitt—Yes, sir; I think the batteries can undoubtedly be installed in such cases with economy. It is merely a question of size. If you install a battery powerful enough to do the work, it will do it well and reliably. The trouble in most cases has been an overrating of the batteries. The batteries are expensive, and in most cases the railroad companies have been afraid to buy a battery large enough to do the work well. If you buy a battery which is too small, it will go to pieces. If you pay enough money to get one that will last you for years, it will do the work well and will be a valuable auxiliary. Whether it will be a saving to any considerable extent, in this particular case, I could not say off-hand. It could be figured out, and possibly effect a

considerable saving. From what you have said, I can see that if you are paying for a 24-hour day, and you could accumulate a certain amount of power in an accumulator, you might reduce the amount of power which you are paying for; in other words, if you are paying for 1,000 horse power, you might reduce it at the end of your present contract to a lower amount, and use your power then the whole 24 hours. That is a possibility; whether it would save you money, I would not wish to say off-hand. It would have to be considered; the expense of the battery, maintenance and such things would have to be figured out. As far as the physical possibilities go it is perfectly feasible.

Mr. Dyer, Augusta—I would move a vote of thanks to Mr. Hewitt for this valuable paper. It is certainly one we have all appreciated, and we are under many obligations to Mr. Hewitt for it.

The President—In putting this motion, I will say that Mr. Hewitt deserves great credit for having been present to read the paper and answer the questions which have been put to him. One hundred times the force and value of the paper is given by the author being present and able to follow it up by answering questions as Mr. Hewitt has done. [Applause.]

Mr. Dyer's motion was put and carried.

The President—Gentlemen, I will run the risk of offending those who voted "no" on the proposition to hear from the storage battery men by allowing any of those who are present to announce where they may be found by those gentlemen who wish to ask them questions. If any of the representatives of the storage battery companies are here, will they please say now when and where you may be found by gentlemen who wish to investigate this subject?

Mr. Lloyd, Philadelphia—The Electric Storage Battery Company, of Philadelphia, will have a room at the International Hotel from now on, where we will have representatives to answer all questions. We have an exhibit in the hall below, and representatives are always there ready to answer questions. We will put a card up in the rotunda of

the hotel, immediately when we get back, announcing the number of the room, where representatives will be found, who will be glad to answer questions.

THE PRESIDENT—The next business is the paper on "Power Distribution and Use of Multiphase Current Transmission for Ordinary Street Railways," by Mr. Maurice Hoopes, Electrical Engineer, Lynn and Boston Railroad Company, Lynn, Mass. Mr. Sergeant says that Mr. Hoopes intended to be here to read his paper and answer questions, but his health has been so bad that he was compelled to abandon his work and go away for recuperation, and he could not be here or attend to any other business.

REPORT OF THE COMMITTEE ON "POWER DISTRIBUTION AND USE OF MULTIPHASE CURRENT TRANSMISSION FOR ORDINARY STREET RAILWAYS."

THE SECRETARY read the paper, as follows:

Mr. President and Gentlemen:—The subject that has been assigned me for discussion is one that has received considerable attention in recent years. Aside from the demands of what is usually considered steam railroad service, the business of the ordinary urban and suburban railways has grown lately in a way that requires some means of augmenting the usual method of power distribution. Lines have been extended to greater distances from power stations, and traffic has increased on lines which always have been remote from their points of power supply. These conditions have arisen at places where disadvantages of location or lack of sufficient load would render additional power stations unprofitable. To meet such demands several methods have been devised. The consideration of the comparative merits of these systems is the principal purpose of this paper. Before undertaking this task, however, the writer desires to discuss some of the conditions met with in the operation of the ordinary 550 volts distribution system. Some of the points raised have been frequently made. For these, an apology is offered in advance, the excuse being that they are sufficiently important to bear reiteration.

The usual electric railway distribution system, with its copper network as one-half, and its iron network as the other half, offers rather more complicated problems than does the ordinary form of all copper circuits. The latter system is symmetrical, whereas the former is likely to have greater resistance in the copper than in the iron portion. A rule that holds good of both systems is that *the maximum benefit in re-*

duction of total resistance, due to the addition of a given amount of conductor, results when the addition is made to the parts in which the drop is greatest per unit of length. An observance of this rule is important in adding to distribution systems. This demands a careful analysis of existing conditions. Before adding feed wire to a railway circuit, it is important to know the drops, under usual load, of the parts of the circuit. These may be found by the use of pressure wires, or by short circuiting the trolley wire to the rail, and passing a given current through the circuit, measuring the total drop and deducting the calculated overhead resistance from the total resistance thus found. Private telephone lines serve the purposes of pressure wires to measure track drops, and public lines, connected through the exchange, may be used without interference with service. An exception to the general rule, that the copper should be added to the part of the circuit showing the greatest resistance, is the case of poorly bonded track that may show less resistance than the overhead. Reinforcing such track with overhead copper connected to each end of all special work may result in the greater decrease in the total resistance of the circuit. This is really a special application of the general rule, rather than an exception to it, however.

Means for regular and easy measurement of track joint drops should exist. For track having frequent high resistance joints, there is no better way than walking over it with a low reading volt-meter connected to prongs on the end of a stick, that it may be bridged across joints. For detecting poor joints in good track, where they are far apart, and for the general inspection of the condition of track wiring, a car is convenient. A box trailer with each wheel insulated from all others, and a volt-meter connected between the two wheels on each side of the car, may be used. A third meter connecting the two opposite wheels will indicate defects in cross bonding. The writer considers that it is unnecessay to complicate the measurements by attempting to measure the resistance of the joint. His experience is that, if a bond is loose enough to have abnormal resistance, it will get worse rapidly, and show excessive drop with even small amounts of current. It behaves very much as did Longfellow's little girl, and is either "very, very good" or "horrid."

It is universally recognized that the maximum efficiency is obtained from a distribution system when it is operated as a whole, and not divided into sections. The liability of accident to railway trolley wires makes it necessary to separate them in such a way that trouble at one point will not block the whole road. These sections should be as few as possible, while accomplishing the purpose for which they are designed.

Where one road has two or more power stations, the sections approximately equidistant from each of two stations should be connected with both. They may then serve to equalize the load between stations, the

common sections being cut loose from the station needing to decrease load. Two feeders to such a section, one from each station, constitute a tie line between stations. If desired the potential may be raised in one station to a point that will deliver current into the other. Unless the drop in the combined feeders is excessive, it will probably be safe to allow the section attached to take the increased potential. Tie lines between stations which serve none but emergency purposes, are expensive, especially if the stations are distant from each other.

Where the ordinary methods of distribution are not applicable because of the prohibitive amount of copper necessary, some one of the following systems is commonly used to care for the particular section:

1. A "Special Generator" run at increased voltage and usually over-compounded as much as possible, handling the section and no other load.

2. A "Booster," consisting of a series wound generator, connected in series with the feeder as it leaves the main station bus. The field turns of this generator should be such as to make the e. m. f. of the armature as nearly as is possible equal to the drop in the feeder, throughout all ranges of current.

3. The "Three Wire System." This requires the division of the section into two. One-half is then supplied from the regular bus, and the other from a special generator, with the polarity reversed, to bring the trolley wire opposite in potential to that of the rest of the system. The trolley wire should be so divided into the two half sections as to leave, as nearly as possible, equal loads on the two at all times. With this arrangement, the current in the track is only that flowing from the cars on one-half section to those on the other. If these half sections are located near each other, this path through the track is very short. For this reason, it is usual to make one track of a double track road one half, and the other track the second half section. Unless conditions are such that the cars are likely to be bunched on one track, this seems the better way of dividing. In addition to conducting current between cars, the track has to conduct back to the power station the excess in current used on one half section over that used on the other.

4. The "Alternating Current Transmission System." The only form of alternating current system desirable for railroad work consists of high voltage multiphase generators (or low voltage generators with step-up transformers) in the main station, connected with one or more sub-stations containing step-down and rotary transformers. There are some half dozen such systems in use in this country, of which the best known are those from Lowell to Nashua, and from the station of the Niagara Falls Power Company to Buffalo.

With any of the foregoing systems, the storage battery may be applied as an auxiliary. In a railway power station, a battery is useful to the extent that it improves the station capacity and fuel economy by removing the *immediate* fluctuations. The writer considers that there

are few instances where a battery can be installed, with resulting profit, where its function is the storing of power one hour for use the next. Except with very short time peaks, the battery costs as much as the additional generating apparatus. Particularly in small stations, however, there is such a variable load that it is impossible to average full load from the station for a period of time, because of the inability to handle the very great short time overloads that such an average load demands. In such a station, a battery may result in a considerable increase in station capacity, and, by allowing the engines to operate at practically constant loads, reduce the fuel consumption greatly. While a battery may do these things in the station, it may do even more, remote from the station. In the latter location, it will keep the potential near it practically constant, and will also maintain uniform current flow between the station and the particular point, thus adding the advantages of regulation and greatly increased copper efficiency.

One side of the story makes a pretty good case for the storage battery; unfortunately, the other must be told. The first cost of a battery is so very great that reasonable interest and depreciation on the amount invested will more than consume the apparent saving, in many cases. Especially is this so in the case of a battery located on the line, where it has been shown that the gross saving is the greatest. This is true because it requires a very much larger investment in battery to care for the load variations of a given station, if the batteries must be divided up among several sub-stations, the load factor of each of which is necessarily lower than that of the main station. The sum of the maximum variations of the several stations is always greatly in excess of the maximum variations in the main station. If, however, a power station were to be located at a considerable distance from a single centre of distribution, through which all feeders from the station passed, it is quite probable that a battery placed at the latter point would result in a net saving, due to its giving each—the station and copper—a uniform load.

When it becomes necessary to select from the foregoing list the most suitable system for a given case, there are many conditions to consider in the decision. Either of the first three, the Special Generator, the Booster, or the Three Wire System, may be arranged with the apparatus in any railway power station, assuming that it includes a reserve generator of the necessary size. It is better to use standard railway machines for these purposes, and, if possible, to arrange the station so that any one of the regular station machines may be used.

It frequently occurs that one or more sections of lines fed from a certain station have copper enough leading to them to care for them properly at all times, excepting a few hours on each ordinary day, and for longer periods on heavy days. While the work may be quite variable at times of light load, when the load increases it becomes more nearly uniform. Such sections may be satisfactorily supplied over the

copper designed for the lighter load, by raising the voltage on the station end of the feeder during heavy loads. Usually, the margin in the field rheostat will allow the increase of voltage on any one of the generators, to a point considerably above normal. When this is not so, it is possible that the generator speed may be increased, unless limited by the requirements of safety in the driving engine. In one or both of these ways, it is often possible to get from 700 to 750 volts from a standard 550 volt machine. This increase enables the heavy load on the section to be handled very satisfactorily. The voltage at the feeder end necessarily varies with the load, and with ordinary fluctuations there may easily be 100 volts difference between the minimum and maximum. A recording volt-meter placed at the feeder end will show a very inky piece of paper after a run. In practice, on a line which the writer finds it necessary to handle in this way, he gets variations from 450 to 550 volts. The minimum is infrequent, however, and the schedule is made apparantly as well as though the potential were absolutely uniform.

Considering the question of abuse of apparatus, the increased voltage is not likely to injure a generator of modern construction. Practically, the only additional care that seems necessary is of the generator fields, noting that the increased current in the shunt windings does not heat them above safe temperature. So long as the potential at the car stays under 600 volts, there is little probability of trouble with equipment. Although the writer has had no such experience, he has known of cases where higher voltages have caused the arcs at controller contacts, when breaking, to jump to the iron frames. This difficulty has been experienced more particularly on small roads using boosters, where one car might constitute the entire load on the booster. At times of throwing off power, the booster holds up its potential for a sufficient time to result in a very greatly increased voltage during the time of the controller opening.

The method just described has the advantage of simplicity and economy. Cases arise, however, when the very great fluctuations in load make its use impracticable. With a line which, at certain times, carries very heavy current, as compared with the average, there must be some means of automatically raising and lowering the voltage at the station end of the feeder, to properly compensate for the variable drops. To accomplish this, a booster is used. As has been said, this machine is a series wound generator, connected in the feeder as it leaves the main bus, and so proportioned that a given current through it will give sufficient field strength to induce an e. m. f. in the armature equal to the fall of potential which the same current causes in the feeder. In practice, this condition is only approximated. Were the generators to have a perfectly straight characteristic curve, of proper pitch to match that of the feeder drop, the feeder and potential would exactly coincide with that of the power station. The curves of all dynamos droop away to-

wards the horizontal as the magnets approach saturation. This results in the booster failing to compensate wholly for drops of currents above a certain amount. In practice, however, boosters are used which raise a feeder potential to 1,000 volts, and care for variable loads without allowing the light load voltages to rise at the feeder ends to dangerous amounts. The system has the advantage of caring for extreme overloads on particular feeders, and is useful in cases where, for short periods of time, the feeder load is such as to cause excessive drops, and the time not great enough to justify increased copper investment. On the other hand, it is expensive of operation, due to the fact that it wastes considerable energy, and that it generates this wasted energy in rather an extravagant way. If the booster is engine-driven, the engine has widely fluctuating loads to handle, the load varying as the square of the current in the feeder. These variations necessarily result in a very low economy for the engine. With a motor-driven booster, there are the constant losses of the two machines to meet. These are not so great as those of the engine and booster, but the necessity of keeping a particular generator for use as a booster limits the flexibility of the arrangement as compared with one which permits the use of any of the regular station generators, and, moreover, the addition of a motor booster does not increase the capacity of the station, as the power to drive the motor must come from the engines. The compounding of the standard types of railway generators is usually such that, when full load current is passed through them, the series turns alone will raise the fields to a point that will induce nearly normal e. m. f. in the armature. This adapts the machine for use as a booster on almost any line, excepting one requiring more than 100 per cent. increase of potential at times of full load. As lines when so overloaded would be much better provided for by the addition of more copper, they need not be considered. In most cases, it is necessary to *cut down* the e. m. f. of the standard generator in order to secure the proper ratio of e. m. f. to current, for boosting, and this may be done by decreasing either its speed or the number of field turns. The former method has the advantage with an engine-driven unit of improving the engine economy by lessening the friction losses and keeping the cut-off at a less wasteful point, whereas the latter is the simpler way. To accomplish this, the writer uses a long German silver strip of sufficient section to carry the proportion of current that it is desired to shunt out of the fields. This strip is fastened to the generator frame, connected across the terminals of the series field, and doubled on itself in such a way that a clamp may be slid back or forth on it, raising or lowering its resistance. Knowing the resistance of the feeder upon which the machine is boosting, the clamp may be shifted to the point where the ratio between the readings of the volt-meter and ammeter is equal to the feeder resistance, and the proper adjustment reached.

For temporary uses, it is possible to make the necessary switch-

board connections with flexible cables as the only adjuncts to the apparatus on the regulation board. A cable which may be attached to the positive load of any of the generators, at the switchboard, and to any feeder, answers the entire purpose. With some boards, it is only necessary to have terminals on the cable that may be inserted into

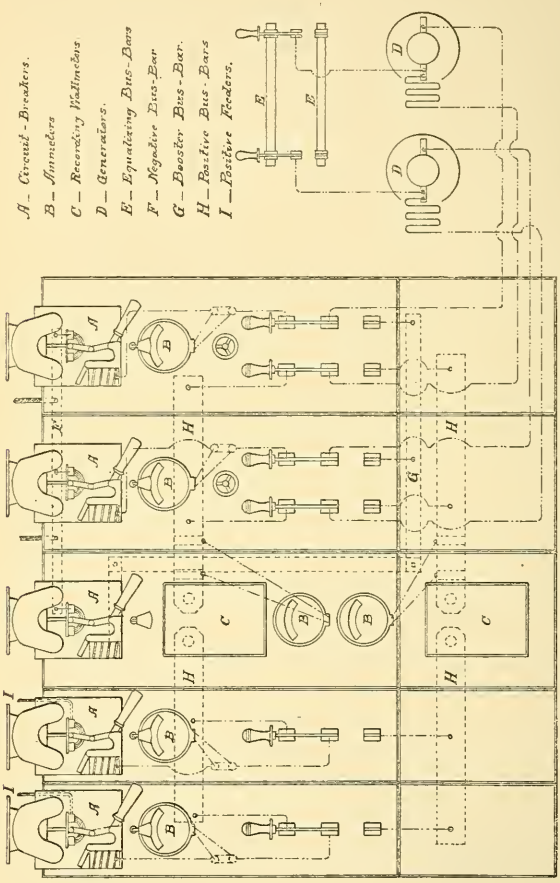


FIG. 1.—DIAGRAM OF SWITCHBOARD FOR USING "SPECIAL" GENERATOR OR BOOSTER.

switch jaws. If the generator leads and the feeders happen to terminate in switch blades instead of jaws, the cable must have its ends fitted to clamp quickly to these blades. With this preparation, in order to transfer a particular feeder to a special generator for the purpose of increasing the voltage upon it, the cable should be attached to the posi-

tive generator terminal, the other end hung convenient to the feeder switch, the generator built up ready for use, the feeder opened and attached to the cable, and finally the circuit breaker and negative generator switch closed.

If it is desired to extend this system to booster working, it is necessary to have a second cable leading from the positive bus-bar and capable of connection to the negative terminal of the booster. It is best to include a circuit breaker in this cable to protect the booster, as the regular generator circuit breaker will be cut out.

At best, however, cables are troublesome appliances and allow only comparatively slow transfers. Moreover, it is impracticable to arrange cables so that two generators may be run in parallel on the special high voltage service. Where a new board is being installed, and where the circumstances justify the alterations in an existing board, such an one as is shown in Fig. 1 meets the required conditions. The two equalizing bars make it possible to run two or more machines each on the regular and high voltage at one time. With this arrangement, any two combinations of feeders and generators desired may be had. When running the "Special Generator," the negative switches are thrown up, and the positive and equalizing switches on the special machines thrown down. The switches on the feeders needing the increased voltage are likewise thrown down. If it is desired to use the auxiliary bus for booster purposes, the equalizing switch is left open, and the adjustable field shunt applied, the negative generator switch is thrown down, after closing the booster circuit breaker, and the feeder is transferred down to the auxiliary bus. This puts the booster generator in series with the particular feeder. One very important thing in this connection is to make sure that the shunt field circuit is open on the boosting generator. It might be advisable to interlock the field switch with the negative generator switch in such a way that the latter could not be thrown down except with the former open.

The drawing of the board shows a watt-meter and an ammeter in each bar. By providing a double throw switch connected in such a way as to open the lower watt-meter from the feeder board, and connect it to the upper bus-bar on the generator side of the ammeter shunt, the four instruments will be in series between the generators, all running on the lower bus, and the feeders all running on the upper bus. This offers convenient means for checking meters, care being taken to see that current passing through the diagonal bar, on the back of the instrument panel, does not introduce an error into the watt-meter indications.

In a modern station of few large units, it is improbable, were the necessity for booster service to exist, that one of the large generators could be spared or would be desirable for the purpose.

In such stations, however, it is usual to install a smaller machine to carry the all night and other light loads. This machine might be relied

upon for the booster work. If the engine driving it have its governor arranged to adjust for a large variety of speeds, both above and below normal, and the unit be designed to run safely at the increased speeds, the combination will be found very convenient for meeting all classes of demand. The speed may be dropped for booster working, and raised when the generator is run at high voltage on a particular feeder. With this arrangement of dependence upon an individual unit for the special service, it is, of course, unnecessary to equip the whole switchboard with the extra negative bus. The double positive bus will be found convenient in any station, however.

The "Three Wire System," although very useful in lighting work, has been of little service in railroad distribution. Its value for the latter purpose has been considerably overestimated, although there are places where its use has resulted in the maintenance of satisfactory potential on sections of track, using the same copper, when the usual system could not approach doing it.

The advantage of the three wire system is based on the fact that it enables the use of double the usual potential for distribution, thus in the perfect case requiring but one-fourth the copper to transmit a given current at a given loss.

This law, that the amount of copper varies inversely as the square of the potential, is due to the fact that doubling the voltage halves the current for a given amount of energy. The same percentage of loss allows a loss of twice the number of volts, and this, with but half the current, admits of the use of copper having four times the resistance, hence one-fourth the weight. The "perfect case" just cited is one in which no third or "neutral" wire is necessary. Such an one does not exist in practice, and this neutral wire has to be supplied to conduct the excess of current used on one side of the system over that used on the other, between the generators and the motors. In railroad work the rail is used as the neutral conductor. It is seldom that a whole road is operated on the system, the common practice being to apply it to only those parts on which the ordinary system is insufficient. Where there are but one or two sections to operate with the reversed potential, the switchboard described may care for them satisfactorily. If one generator is made to build up with reversed polarity, and is coupled into the auxiliary bus, it will handle such feeders as may be thrown upon it as the negative side of a three wire system. The generator may have its residual charge reversed in a number of ways, one of which is to have the shunt field wired through a double throw switch on the machine, arranged to disconnect the field coils from the armature and connect them in the reverse direction to a pair of charging wires fed from the switchboard. The machine may have its residual charge brought back to the usual direction by the commonly used means of throwing in the positive and equalizing switches, with the negative open, and allowing the current shunted from the series coils of the other machines to

energize its series coil. Where three pole switches are used on the generators, the shunt field double throw switches may be omitted, and the field reversed through the series coil by using an X-shaped pair of contact pieces insulated from each other at the point of intersection. These may be pressed against the switch jaws in such a way as to reverse the current shunted from the other series coils through that of the machine to be reversed. Where the three wire system is the regular system of operation, and the sections are divided equally between the two sides of the system, a regular three wire board is preferable. For a less general use of the system, the method described answers as well. The arrangement then becomes the same as that of the "Special Generator," with the polarity reversed, and the potential on the machine may be raised above normal, and the advantage of greater allowable drop in the copper added to that of the saving in track drop, due to the reversed current flow.

The writer has said that the value of the three wire system in railroad service has been considerably overestimated. This statement probably needs explanation. In lighting work, the three wire system saves 62½ per cent. of the copper. Each wire has to be but one-fourth as large as with the two wire system, but it is usual to make the neutral of the same size as the other wires, thus requiring three wires, each of one-fourth the size of those of a two wire system, hence the use in the three wire system of three-eighths, or 37½ per cent., of the copper necessary in the two wire system. Because this is true of lighting work, it is often assumed to be true of railway work. It is not, however, and in no case, where the track renders any appreciable service as a conductor, can the saving from the adoption of the three wire system approach the above figures. In general, its use will make a gross saving of the loss in track (assuming that there is no copper paralleling the track that may be used as a positive feeder). The net saving will be this gross loss in track less the track losses due to the passage of current from car to car, and of the excess of current due to lack of balance, back to the power station, and the increased overhead loss due to the greater drops in the divided feeders than in them when combined. The sketch, Fig. 2, and table, Fig. 3, may present this more intelligibly. It illustrates the simple case of an unbalanced three wire system, and shows that its losses aggregate 4,100 watts under the particular load. If this system were changed to a two wire one by throwing the two feeders in parallel, it would save 400 watts in the feeders, and lose 800 more in the track, leaving a net loss of 400 watts, or about 10 per cent. of the total loss. Such a difference as is shown by this hypothetical case would not justify the complication introduced by the system. The only conditions where the method seems to be applicable, are those of excessive track losses with fair opportunities for balanced load. Such a case existed on the Lowell and Suburban road. They have a heavy business over a double track line to their park, some six miles from the power station. By

changing to positive feeders those formerly used as overhead returns, and operating the line as a three wire one, they very greatly improved the efficiency of the distribution system.

In the selection from the various systems of distribution, of the one best adapted to a particular instance, there is always a large number of variable factors to consider, and usually more or less speculation as to the values of certain ones on which no accurate data are accessible. This makes it impossible to work from fixed laws, and demands individual consideration of each case. For these reasons there is considerable room for divergence of opinions in the matter. The writer has given his ideas as to the comparative infrequency of cases in which the three wire system is desirable. The booster has a very much more general application, and is suited to a greater number of cases than is any one of the other systems. Nevertheless, wherever work can be satisfactorily handled by a special generator, it should be, unless the

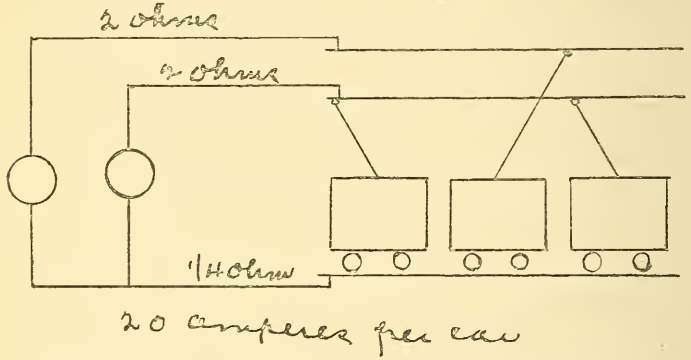


FIG. 2.—DIAGRAM OF UNBALANCED THREE WIRE SYSTEM.

change involves abandoning existing apparatus. The last method saves considerable over the booster, and is preferable for its simplicity. The only limiting condition to its use is satisfactory regulation.

The alternating current system, with rotary converter sub-stations, competes with the booster and special generator in cases where the load factor (the ratio of average to maximum load) is high, and where the regular 500 volt transmission will suffice during only a few of the twenty-four hours. In such a case, the copper losses, because of the length of time during which they are excessive, are so great that they may often exceed the entire expense of an alternating transmission system. The latter system also enters into competition with the independent power station for that class of business that is too remote from an existing station to admit of satisfactory handling by the other transmission methods, and too small to furnish load for such a station as may approach in economy the station from which the alternating transmission

would be operated. Cases of each kind arise with city roads, in their needs for transmission to suburban centers of load, and with interurban roads.

The loads which the city station receives from the suburban centers have usually a very low factor. At morning and night they are excessive, and through the remaining hours comparatively light. Were an alternating transmission system installed for such use, it would probably lie idle a large part of the time, its copper being used to transmit direct current. During the heavy hours it would be called into service. This same service might be rendered by raising the voltage on the direct current feeders by use of the "Special Generators," and allowing the loss, which has been from 5 to 10 per cent. during the light load, to become 25 or 30 per cent. In this way the line may carry three or four times as much current, and maintain the voltage at the distant end.

LOSSES IN WATTS.

	Two Wire System	Three Wire System	Saving
+ Feeder	$60^2 \times 1 = 3600$	$20^2 \times 2 = 800$	-400
— "		$40^2 \times 2 = 3200$	
Track	$60^2 \times \frac{1}{4} = 900$	$20^2 \times \frac{1}{4} = 100$	800
Total	4500	4100	400

FIG. 3.

In comparing the systems it is necessary to compute the annual cost of each, including the items in the following list:

ALTERNATING CURRENT.

Fixed Charges and Repairs on Main Station, Static Transformers, if any, and on Sub-Station Static and Rotary Transformers, and Accessories.

Fixed Charges on Sub-Station Land and Buildings.

Sub-Station Labor.

DIRECT CURRENT.

Interest, Depreciation, and Repairs on such increased cost of Engines and Generators, as is occasioned by their being fitted to furnish increased voltage.

Cost of fuel to produce output representing difference between losses in direct current feeders and those in alternating current feeders and transformers.

This assumes that the same amount of copper is used in each system, that the alternating system does not remove the need for sufficient copper to handle the load with direct current during a part of the time, and that this amount of copper will suffice for heavy loads by means of the increased direct current potential transmission. Should the load be of such a nature that the alternating transmission would be operated throughout the whole time, there may be a correction made in its favor of the annual cost on the increased amount of copper necessary for the direct current system over that for the alternating system. It is probable that the direct current generator and engines need not be increased in cost more than 10 per cent. by the requirements of the increased voltage. The writer has said that he is operating satisfactorily with machines designed for the standard voltage. Points which should be made against the alternating current system, which cannot be given exact money values, are the danger to life from the increased voltage, lack of uniformity in equipment, making lack of flexibility in stations (where, under the other arrangement, any generator may serve any demand), and the danger of delays due to the increased complication of the system, it sometimes requiring fifteen or twenty minutes to start the sub-station machinery and get it into service after it has been stopped in the midst of load by accident. These points of disadvantage are very important ones, and operating companies can well afford to expend considerable money to avoid them. Especially is it undesirable to install for railroad work a system which may be disturbed by the extreme overloads such work introduces, and which cannot be restored to an operative condition immediately the load is brought within bounds. With the rotary transformer system, any short circuit or extreme load, which is not relieved by the sub-station direct current circuit breakers, may stop the rotaries and shut the power off the line during the long interval it takes to start them and put them into service.

In the comparative estimate, the results depend more upon the load factor than any other condition. With it sufficiently high, the alternating transmission may show an economy over the direct current for areas within a very few miles of the power station. Unfortunately, however the yearly load factor is usually very low on railroad work. With such a condition, it is cheaper to have excessive losses in copper at times of heavy loads than to carry the necessary equipment of alternating transmission apparatus to keep the losses down at such times. The railroad manager naturally insists that the voltage be maintained reasonably near its normal value over the whole road at times of heaviest business. Estimates that show immense costs for copper to accomplish this under the regular distribution system, make him turn to the consideration of additional power stations and multiphase transmissions. If he can be shown that he may care for his maximum loads over the existing copper by simply raising the voltage on the station end of the sections of heavy loss, and pay for the loss with coal instead of with interest and deprecia-

tion on a great amount of additional machinery, he is likely at least to determine carefully which he can better afford to do.

While, in the writer's opinion, the majority of cases may be best handled by direct current distribution, there are many instances of need for a distribution system where none but the alternating current system is applicable. Where water powers are used, they are almost always so remote from the center of load that very high potentials must be used for economical transmission. Long interurban roads operating so few cars that load can be had for only one power station bring a condition where distribution must be accomplished by sub-stations, on the alternating system. The Lowell transmission presents a case where it was a problem whether to care for the new territory with a separate station, or to transmit from the existing station. So much has been written about the multiphase current system that was decided upon and installed there, that it is unnecessary to attempt a description of it. Mr. Sullivan, the General Manager of the Company, has kindly furnished the writer with a copy of the estimates from which the choice of systems was made. He states that operation justifies the estimate in its statement of the cost of the multiphase system. It showed the cost of power delivered to the trolley wire to be for the transmission system 70 per cent. of that for the separate power station. There were no figures showing what this work could have been done for with a booster system. Inasmuch as the latter method had been used successfully in place of the other, temporarily, it would be interesting to know its comparative cost. Tests of the Lowell system extending over eighteen days show an all time efficiency of 70 per cent. as measured from alternating generator output to rotary converter output, the losses being those of two sets of static transformers, line and rotaries. The maximum efficiency for any one day was 73 per cent. The voltage regulation at the sub-station is about equal to that of a well-governed steam-driven power station.

The writer has said that the use of alternating currents for ordinary electric railways is limited to the rotary converter system. This is due to the fact that alternating current motors, in their present state of development, are not adapted to the needs of such railways. As yet, their use for traction purposes is limited to a few European roads, of which the best known is in Lugano, Italy. Alternating motors have the disadvantages of limited torque and tendency to synchronism. This makes them poorly adapted for the uses of any line but one having long runs at practically uniform speeds, and few stops. These conditions are those of a through express service between cities. Accommodation and ordinary street railway services are such as can only be handled satisfactorily by direct current motors. At first notice, this fact seems rather contradictory to one's ideas of the flexibility of alternating currents. The ideal system has been thought to be one composed of a generating station containing large multiphase generators, with lines distributing current at a potential high enough to require but a com-

paratively small amount of copper, static step-down transformers, and motors that may be regulated throughout all desired variations of speed by merely changing the impressed e. m. f. with a controller depending upon the use of various ratios of transformation. This dream included the freedom from the care of commutators, and pictured a car equipment that would need a minimum of attention. Were it possible to realize all of these advantages, it is probable that the somewhat serious complication introduced by the necessity for two trolley wires might be tolerated. There seems to be little probability, however, of an early solution of the problem of adapting the alternating motor to the intermitting work of the street railway.

In conclusion, the writer desires to say that the title of this paper may have led some to expect rather more particular attention to the multiphase transmission system, and less about direct current distribution. He has, however, given the various systems the same relative importance in the paper that he considers them to have in application. Hence, the subordination of the alternating current system in the consideration of the general subject of "Power Distribution."

Respectfully submitted,

MAURICE HOOPES.

The President—Gentlemen, Mr. Hoopes is not present to answer questions, but we would like to have such discussion of the paper as may be suggested by the reading of it.

Mr. Kelly, Columbus—I move that a vote of thanks be tendered to Mr. Hoopes for his paper; also that a telegram be sent to him congratulating him upon the paper, and wishing him an early restoration to health. Carried.

REMARKS OF MR. CHARLES HEWITT ON MULTIPHASE CURRENT TRANSMISSION FOR STREET RAILWAYS.

Mr. Hewitt, Philadelphia—I trust the meeting will pardon a few words in reference to this paper. It is a matter which has interested me a great deal. I have done considerable figuring on such transmission as it is the closest competitor to the storage battery and booster, of which I spoke earlier in the session. As far as the problems have come up in ordinary street railway work, with such distances as ordinary roads handle, I have been unable to figure any economy in the multiphase transmission, as compared with the direct, using the booster. When you get to

distances beyond, possibly, fifteen miles, the problem then becomes more favorable to the alternating current. There are several things to be considered. In the first place, if you have a long line already running, you have copper which you are already using on that line. The first thing you must consider is whether this copper can be used in alternating transmission, should you use such; and in the second place, could the cables be used economically in an alternating current transmission. Very frequently they cannot. If you have a cable of 500,000 circular mills in use, and you want to use an alternating transformer of high potential, in which you only require a No. 0 wire, you do not need to use a wire of 500,000 circular mills where No. 0 wire would do, and you do not want to throw it away. That becomes a serious question, where the lines are underground, as they are in Philadelphia and other large cities, and the problem is largely magnified, for the reason that the insulation cost of three cables to run the tri-phase transmission becomes enormous, as compared with the cost of the copper, the extra copper for the single cable to run the direct current; and in the cases that we have met with in Philadelphia, for our long lines, where we run underground cables for a large part of the area, the difficulty has been that the insulation cost of three cables was so great that it was more expensive to use a smaller cable, and use three of them, than to use the single cable and use more copper. We figured out very carefully the question of alternating tri-phase transmission, in place of our battery, and we found the battery more economical, and I think the results have shown conclusively that such is the case. From what I gather from Mr. Hoopes' paper, I think he confirms the conclusions which we have reached. As I stated before when you get to long lines, you then get to cases which are more favorable to the tri-phase, and it is a question in my mind whether we are not on the eve of a very successful tri-phase motor, so that instead of using the rotary transformers we will use the static transformers with a tri-phase motor on the car. I feel sanguine of the future possibility of this motor. I have

seen such motors working experimentally, and they bid fair to give very good results.

The President—If there is no further discussion on this paper, it will take the usual course and be filed and spread upon the minutes.

Is there any business of any character whatever, that is proper to come before the Convention, that any member has to present? The meeting is now open for any questions that any member may present.

Motion to collect statistics relating to municipal ownership of street railways.

Mr. Davis, Williamsport—Mr. President, there is one matter I would like to present, and that is the question of obtaining information, principally from abroad, as to the cost — operating expenses and general expenses — of the operation of street railways by municipalities. We have questions of that kind arising continually, and it is almost impossible for any single company to collect the statistics. These statistics would principally consist in securing official documents from abroad. If it is thought that the Executive Committee could, through its Secretary, secure the official documents from abroad, I make a motion that the matter be referred to the incoming Executive Committee for such action as it may see fit to take.

The President—I am unable to state how far Mr. Sullivan went into that question, but I believe it is a fact that Mr. Sullivan made a visit abroad and got all the information obtainable upon this subject; and I have no doubt that correspondence with him would secure all that he has at hand. I do not think he presented all of the details in his report. I expect that he is in possession of everything that is obtainable. However, if you wish to make a motion that the Secretary shall enter into this correspondence, the matter can be put before the meeting.

Mr. Davis—I make that motion. The information obtained would be open then to such of the members as desire to make use of it. I make that as a motion, that the Sec-

retary be requested to secure information relative to the working of municipal street railway plants.

Motion seconded.

THE PRESIDENT—It is moved that the Secretary be instructed to procure all possible information in regard to the cost, operating expenses and services rendered, of such street railways as are controlled by municipalities in foreign countries.

MR. DAVIS—Before the question is put I would call attention to this point. The municipal ownership question is assuming two phases—one, the ownership and operation by municipalities; and the other, the leasing of roads owned by municipalities to private companies, under certain restrictions. The latter is probably the form that the question will assume in the United States. Abroad, the municipal control and operation is the more usual form. I would suggest that the inquiry be two-fold—first, where the municipality directly controls and operates the railway; and second, where the plant is owned by the municipality and leased out and operated by private enterprise.

MR. KERPER, Dayton—I believe that Mr. Sullivan goes into details on both these points in his report.

THE PRESIDENT—Any gentleman who wishes details on this question can obtain them by corresponding with Mr. John Young, General Manager of the Glasgow roads. He will be glad to answer personally, and provide any information that may be asked. He has it in printed form.

MR. BEAN—A motion was made yesterday by Mr. Littell that this matter be referred to the incoming Executive Committee. I have not had any conversation with Mr. Littell, as to whether he desired to side-track the subject, or desired the Executive Committee to go into details. It is immaterial to me. If Mr. Davis will apply to the future Executive Committee, he can get more information than from Mr. John Young. I trust that he will follow it up. We are not all situated as they are in the State of New York, where franchises run 999 years. Out our way we have them for thirty years and fifty years.

The motion of Mr. Davis was put and carried.

APPOINTMENT OF THE COMMITTEE TO NOMINATE OFFICERS AND SELECT THE PLACE FOR THE NEXT MEETING.

THE PRESIDENT—The next business is the appointment of the Committee to nominate officers and select the place for the next meeting. You will bear in mind that this Committee simply makes recommendations. If the Convention at large does not wish to accept these recommendations, they can be voted down, and other nominees substituted, or another place of meeting selected. The Committee will consist of

HENRY M. WATSON, Buffalo, N. Y., Chairman;
GEORGE B. KERPER, Dayton, Ohio;
ERNEST WOODRUFF, Atlanta, Ga.;
W. WORTH BEAN, St. Joseph, Mich.;
ALBERT T. POTTER, Providence, R. I.;
JOHN A. RIGG, Reading, Pa.;
E. S. GOODRICH, Hartford, Conn.

I would suggest that these gentlemen get together as soon as we have adjourned, and make their arrangements for a meeting, in order that they may report to-morrow.

If there are present representatives of localities which desire the meeting to be held in their city next year, we will now give an opportunity for five minute speeches by those who wish to talk upon the subject.

INVITATION TO MEET IN CINCINNATI IN 1898.

MR. DAVIS, Cincinnati—Mr. President and gentlemen of the Association: The city of Cincinnati desires you to hold your next meeting in that city. I have here some invitations to that effect, which I shall ask the Secretary to read.

THE SECRETARY read the following invitations:

THE CINCINNATI STREET RAILWAY COMPANY,
CINCINNATI, October 14, 1897.

THE AMERICAN STREET RAILWAY ASSOCIATION,
NIAGARA FALLS, N. Y.

Gentlemen:—It affords me pleasure to extend to you the invitation, as foreshadowed in the resolutions hereto attached, which were adopted unanimously, at the meeting of the Board of Directors of the Cincinnati Street Railway Company, held September 7th, 1897:

"RESOLVED, that the Cincinnati Street Railway Company hereby extends a hearty and cordial invitation to the American Street Railway Association to hold its Convention for the year 1898 in the city of Cincinnati.

RESOLVED, that the President be, and he is hereby authorized and empowered to appoint delegates to the coming Convention, who shall attend the said Convention, extend the invitation of this Company, and, if possible, secure its acceptance."

Trusting we may have the pleasure of entertaining the Association during the year 1898, and with best wishes for the continued success of same, we beg to remain,

Very respectfully,
JAS. A. COLLINS,
Secy. and Asst. Gen. Mgr.

CINCINNATI CHAMBER OF COMMERCE AND MERCHANTS' EXCHANGE,
CINCINNATI, October 16, 1897.

THE AMERICAN STREET RAILWAY ASSOCIATION,
NIAGARA FALLS, N. Y.

Gentlemen:—We desire to call your attention to the advantages which our city affords for holding such meetings as yours, and wish to hereby extend a most cordial invitation to your Association to hold your next Convention in this city. We shall be glad to do anything that the occasion calls for to promote your interests.

Truly yours,
WM. McCALLISTER,
President.

MAYOR'S OFFICE,
CINCINNATI, October 16, 1897.

THE AMERICAN STREET RAILWAY ASSOCIATION,
NIAGARA FALLS, N. Y.

Gentlemen:—The undersigned, in behalf of the city of Cincinnati, extends to you a cordial invitation to hold your next Convention within its portals.

It will not be necessary for me to enumerate to you all the advantages of our city as a convention city. Her central location, railroad facilities, excellent hotels, and numerous places of amusement are well known to you. I will also say, in behalf of the citizens, that they will do the utmost in their power to make your stay an agreeable and profitable one.

Very respectfully,
GUSTAV TAFEL,
Mayor of Cincinnati.

Mr. Davis, Cincinnati—The letters you have heard read express so clearly the desire of our citizens to have you visit our city and hold the next annual Convention there, that I shall only add a very few words. It gives me pleasure, in person, on behalf of the Board of Directors of the Cincinnati Street Railway Company, and on behalf of the other street railway companies directly connected with us in that neighborhood, to extend a most cordial invitation to hold the Convention in our city, which is so well situated geographically, being very near to the center of population in this country, and which has so many and great conveniences locally, that it is especially adapted for the holding of conventions. We have suitable halls for meetings, and halls in connection therewith for the exhibition, which are not excelled in this country, and the city is so centrally located that it is convenient to all parts of the country. I am sure if you decide upon Cincinnati that you will be well satisfied with your choice. The city of Cincinnati, through its Mayor, the Chamber of Commerce, the Cincinnati League, which represents the most prominent business men of the city, the street railway companies of that neighborhood, and the citizens at large, wish to join in assuring you a most cordial and hearty welcome. [Applause.]

INVITATION TO MEET AT OLD POINT COMFORT IN 1898.

The Secretary read the following invitation:

Newport News, Hampton and
Old Point Railway Company,
Hampton, Va., October 18, 1897.

Mr. T. C. Penington,

Secretary, American Street Railway Association.

Dear Sir:—Having heard that Old Point Comfort, Virginia, might be selected as the place for the next annual meeting of the Association, and hoping that such may be the case, we write to say that we shall be glad to have you meet here, and will be pleased to do what we can for the pleasure of the Association while here.

Yours respectfully,
F. W. DARLING,
President.

Mr. Baker, Washington—Mr. President, I want to say, in the first place, that I understand there is a large delegation of transportation men and others at this meeting, who want to be heard, either before the Convention or the Committee, in reference to holding the next annual meeting at Old Point Comfort, Va. I have met quite a number of them, but do not see any here just now.

The President—They can present their claims to the Committee.

invitation to meet in boston in 1898.

The Secretary read the following invitation:

Massachusetts Street Railway Association,
Boston, October 15, 1897.

The Massachusetts Street Railway Association cordially invites the American Street Railway Association to hold its next annual meeting in the city of Boston.

Massachusetts Street Railway Association,
By its Executive Committee,
John R. Graham, *Chairman.*

Mr. Foster, Boston — I have the honor to be a member of the Executive Committee of the Massachusetts Street Railway Association, and we have extended to you a very cordial invitation to come to Boston. We desire to have you come there, and we will try to entertain you well. We will make it pleasant for you, if possible, while you are there. We think we have very many things of interest, which might make it to the advantage of all to go there. We have one of the largest systems of street railways in the United States. I refer to the West End Street Railway Company. They have some very large fully and completely equipped power stations, which in themselves will be points of great interest and benefit to all street railway men who visit them. We also have the subway, which will probably be completed by the time you go there, and that certainly will be something of interest to all. We have many places of historical interest in and about Boston, and

we desire to have you come there. We shall be sadly disappointed if you do not come. I will close, gentlemen, by extending to you all a cordial invitation to come to Boston in 1898. [Applause.]

INVITATION TO MEET IN OMAHA IN 1898.

THE SECRETARY read the following invitations:

THE COMMERCIAL CLUB,
OMAHA, NEB., October 4, 1897.

MR. T. C. PENINGTON,
SECRETARY, AMERICAN STREET RAILWAY ASSOCIATION,
CHICAGO, ILL.

Dear Sir:—The Commercial Club of this city, by unanimous action, cordially invites your worthy organization to select the city of Omaha, Neb., as the place for holding your next annual meeting for the year 1898.

The membership of this Club is composed of all the business and professional interests of this city of all classes.

Provided you select Omaha for your next meeting place, we will furnish ample accommodations for meetings, including hall and committee rooms, also guarantee first-class hotel accommodations at reasonable rates. The Trans-Mississippi and International Exposition will be in operation at that time, which will be second only to the World's Fair, and will be an attractive feature for your meeting.

Omaha is the central city of the United States. Twenty lines of railway diverge from Omaha, forming a direct line of road to every city in the country. This city is midway on the shortest transcontinental line between the oceans. Provided any of your members desire to go further west, a direct line of road runs from Omaha to all places of interest, including the Black Hills, Yellowstone Park, Colorado, Salt Lake City and California. The fact of the Exposition being in Omaha in 1898, will guarantee you less passenger rates than you could otherwise secure.

Again we urge you to come to Omaha in 1898. The freedom of the city is extended to you and you will be entertained by warm hearts and prodigal hands.

Hoping your meeting will be attended with success, and extending to you our best wishes, I am,

Yours truly,

J. E. UTT,
Secretary.

TRANS-MISSISSIPPI AND INTERNATIONAL EXPOSITION,
OMAHA, NEB., October 13, 1897.

THE AMERICAN STREET RAILWAY ASSOCIATION,
NIAGARA FALLS, N. Y.

Greeting:—I am directed by the management of the Trans-Mississippi and International Exposition to extend to your Association a cordial invitation to hold its annual meeting for 1898 at the city of Omaha.

The Trans-Mississippi and International Exposition is designed to illustrate the resources, products, capabilities and civilization of the Trans-Mississippi states and territories, of the United States and of foreign countries. It is proposed that this Exposition shall be second only to the World's Columbian Exposition held at Chicago in 1893.

The very low railroad rates which will be granted to visitors to the Exposition will be available for members of your Association, and will be of benefit in securing a large attendance at your annual meeting.

The Exposition will open June 1st, and close November 1st, 1898. The management of the Exposition and the citizens of Omaha will use every effort to make your sojourn in our city both pleasant and profitable.

Trusting that it may be the pleasure of your Association to decide to hold its annual meeting for 1898 in the "Gate City" during the Exposition period, I am,

Yours very truly,
JOHN A. WAKEFIELD,
Secretary.

EXECUTIVE CHAMBER,
LINCOLN, NEBRASKA, October 5, 1897.

THE AMERICAN STREET RAILWAY ASSOCIATION,
NIAGARA FALLS, N. Y.

Gentlemen:—I am informed that your Association will be invited to hold its 1898 meeting at Omaha, the metropolis of Nebraska. I take pleasure in joining in this invitation and assure you that if accepted you will receive a warm welcome from the people of Nebraska. The citizens of Omaha are justly proud of the manner in which they have handled large conventions and as the great Trans-Mississippi and International Exposition will be held there from June till November, 1898, your attendance would doubtless be largely increased and opportunity afforded the delegates to witness the Exposition while attending the Association meeting. I hope that you may see your way clear to select Omaha as the place of meeting.

Yours very truly,
SILAS A. HOLCOMB,
Governor.

Mr. F. W. Taylor, Omaha—Mr. President and Gentlemen: I regret very much that I only reached Niagara Falls an hour since and that I have not been able yet to meet the Secretary of the Association, and get into proper touch with the organization, nor to present my credentials in regular shape. But I want to ask that you meet in Omaha next year and to emphasize the fact that we really and truly want you. Omaha is a very respectable town, with decent hotels and white people living there. Next year there is to be held in that city the Trans-Mississippi Exposition which we believe will be the largest Exposition ever held in this country, except the World's Fair, and we want you to take this opportunity to visit us, and we hope you will do the right thing and come to Omaha next year. It is to be the star convention town. About forty large associations have already decided to go there. I do not think I need say anything in regard to the way in which we can take care of the people, as that will all be brought before your Committee. We have letters of invitation from the Governor of Nebraska, the Mayor of Omaha, the Secretary of the Commercial Club, the Secretary of the Trans-Mississippi Exposition and practically everybody else in the state.

The Omaha Street Railway Company joins heartily in the request. All our inhabitants join in the invitation and I am here to present it.

At the proper time this evening, I hope to present this matter properly to your Committee, and I thank you cordially for allowing me to speak of it to you at this time. [Applause.]

The President—Mr. Watson, the Chairman of the Nominating Committee, announces that the Committee will hold a meeting at the Cataract House at seven o'clock this evening, and those who desire the next Convention to be held in their locality should be there to answer questions which the Committee will put to them. The entertainment of the American Street Railway Association has become quite an undertaking; and the Executive Committee for the coming year will expect any city, which desires the

meeting, to make ample provision that they will be able to carry out plans for the business arrangements and entertainment of the Association properly; and we expect all such representatives of cities to meet the Nominating Committee at seven o'clock this evening at the Cataract House.

THE PRESIDENT read the programme of entertainment for the afternoon and evening, provided by the local committee; after which, upon motion, the meeting adjourned until Thursday morning.

THURSDAY'S SESSION.

PRESIDENT MCCULLOCH called the meeting to order at 10:45 o'clock, a. m.

THE PRESIDENT—I desire to supplement the invitation which Mr. Littell extended to the delegates to go to the power house of the Buffalo Railway Company, in Buffalo. When the Executive Committee met here last February, he showed us through the power house. It is well worth anybody's time to go there to see it. There may not be anything newer or better than a great many of us have, but we will all find there lessons in tidiness and neatness and care that are good things for us to see. The method of handling coal and firing is very complete and perfect.

Is there any one present to make a report for the committee which was appointed two years ago, at the Montreal Meeting, to confer with a like committee from all of the different electrical and engineering societies ? There was a gentleman here yesterday, who had a report with him, and I asked him to be here this morning, to take that report up for the first business.

MR. BACON, New York City—Mr. Frank R. Ford, of the firm of Ford & Bacon, my business partner, was appointed by this Association two years ago as a special delegate to meet delegates from several electrical bodies to prepare a set of rules governing the construction and installation of

wires and apparatus for electric lighting and street railway systems. Mr. Ford is not able to be present at this meeting, and he requested me to make the report.

REPORT OF THE SPECIAL COMMITTEE TO CONFER WITH ALLIED ASSOCIATIONS AS TO RULES AND REGULATIONS FOR THE INSTALLATION OF WIRING AND APPARATUS FOR ELECTRIC LIGHT, HEAT AND POWER.

Mr. Bacon read the report, as follows:

National Conference on
Standard Electrical Rules,
New York, October 15, 1897.

The American Street Railway Association,

Gentlemen:—Supplementing the reports to your Secretary of July 21, 1896, and October 20, 1896, made by me as delegate of the American Street Railway Association to the National Conference on Standard Electrical Rules, I would state that upon December 11 and 12, 1896, the Committee on Code of this Conference adopted its final report. The following associations were represented by delegates:

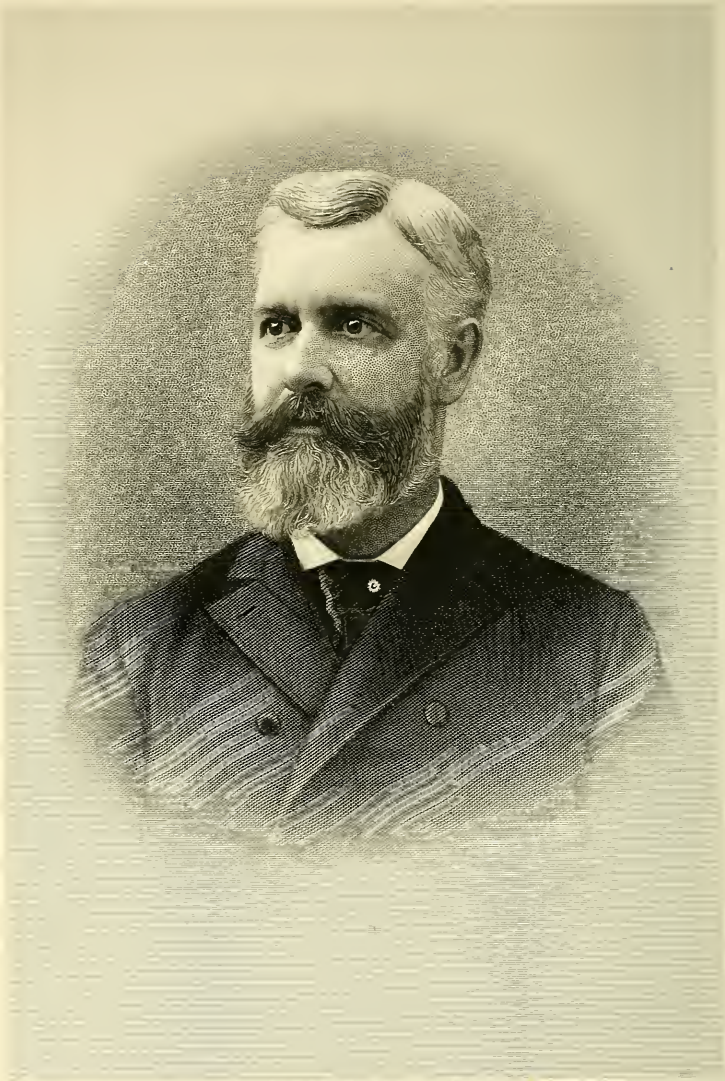
American Institute of Architects.
American Institute of Electrical Engineers.
American Society of Mechanical Engineers.
American Street Railway Association.
Factory Mutual Fire Insurance Companies.
International Association of Fire Engineers.
National Board of Fire Underwriters.
National Electric Light Association.
Underwriters' National Electric Association.

As a result of this Conference a revised set of rules has been formulated, to which the name "National Electrical Code" has been given, a copy of which is herewith submitted.

This Code has already been adopted or approved by all of the bodies forming the Conference as above stated, with the exception of the American Society of Mechanical Engineers and the American Street Railway Association. At the next meeting of the former Society, the question of adoption will come up and favorable action will undoubtedly be taken.

As the meeting of the American Street Railway Association is the last of the societies and associations named above, it is consequently the last one to which this Code is submitted for approval.

As the representative of your Association, I was appointed Secretary



Wm. J. Richardson.

of the Committee on Code which performed the actual work of revising the rules, and have kept in close touch with all the details of this work.

The new Code contains many desirable amendments as to the technical requirements, having had the advantage of the co-operation of some of the most prominent electrical experts in the country representing the various associations and societies in attendance.

The form of the Code has also been entirely revised, so as to obtain a more logical and up-to-date arrangement. This fact is particularly important as previous codes contain many repetitions and interpolations. It is not claimed that the Code is perfect, but it can be said that each word in it was carefully considered by a number of men representing the most adverse interests and points of view. Amendments can and will be made from time to time as the progress of the art demands.

The great desideratum of uniformity has, however, been obtained, so that now, instead of a number of sets of electrical rules governing construction throughout the country, the "National Electrical Code" will be recognized as the one set of rules to which all electrical work must conform. The fact that it has already been adopted by almost all of the important bodies represented in the Conference insures this result, and in order to complete the good work made possible by the co-operation of this Association, I earnestly recommend that the American Street Railway Association give its formal approval to the "National Electrical Code."

Respectfully submitted,

FRANK R. FORD,
Delegate.

In conjunction with the reading of the report there were distributed at the meeting small paper bound books embodying the "National Electrical Code."

THE PRESIDENT—This book will be very valuable to a great many of us.

MR. CONNETTE, Nashville—I move the adoption of the report. Carried.

AMENDMENT TO ARTICLE VII. OF THE BY-LAWS.

THE PRESIDENT—At the meeting of the Executive Committee held at Niagara Falls last February there was presented a notice of amendment to the By-Laws, to be acted upon at this meeting, which would leave it discretionary with the Executive Committee to have the meeting at such time in the month of September or October, as they might

think best adapted to the locality in which the meeting was to be held; so that if the Convention should be located very far North it could be held a little earlier than this, and if located very far South it might be continued to this late day. This amendment was suggested by the uncertainty of the weather at this season of the year, as far North as we are now. The present regulation is that the meeting shall be held on the "third Tuesday of October in each year." The Secretary will read the proposed amendment.

The Secretary read the following:

"Mr. Hippee gave notice of the following amendment to Section VII. of the By-Laws—Insert in place of the words, 'On the third Tuesday in October, in each year, at such hour and place as shall be designated at the preceding meeting,' the following, to wit—'At such time in the month of September or October, in each year, as the Executive Committee may decide to be suited to the locality in which the meeting is to be held; the time to be decided on and each member of the Association notified of the selection by the first day of March in the year in which the meeting is to be held.'"

Mr. Cunningham, Boston—I move that the amendment be adopted.

Motion seconded.

The President—It has been moved and seconded that the amendment be adopted. We will now hear any discussion that may be offered. The necessity for this change has been felt by each Executive Committee in making its arrangements for the Convention; and I do not think this privilege will be abused or that future Executive Committees will be erratic in the use of it, and it is a privilege which may be safely extended to them. It has been brought forcibly to my attention by things which have happened more than once.

Mr. Davis, Williamsport—I move that the date be fixed not earlier than the fifteenth day of September. We run our parks up to the middle of September and as managers we ought to be on hand. I understand that this is the preference of a number of gentlemen.

The President—That amendment is admissible now.

Amendment seconded.

THE PRESIDENT—The motion is that the amendment be restricted, as it were, to a period between the fifteenth of September and the first of November.

MR. NEWMAN, New Orleans—I come from a city very far South. We would like this Convention to come to New Orleans. We do not expect it next year, but we want you to come one of these days. We want you to come at a time of the year when we can make it most pleasant for you, and for that reason I would like to have the dates fixed to cover the fifteenth of December, or any time prior to that date, which this body thinks proper. We would like the date fixed as late as possible if it can be done.

THE PRESIDENT—If we decide at any time to go to New Orleans we can pass special resolutions to fit that place. I think we had better not take in too large a range of time.

MR. NEWMAN—Why not settle the question now? I assure you that we want the Convention to meet in New Orleans as soon as we can get you. It can do no harm and it may do some good to have the date extended.

THE PRESIDENT—Do you offer that as an amendment?

MR. NEWMAN—Yes, if the gentleman will accept it.

MR. DAVIS—I have no objection as far as we are concerned. The matter is left to the Executive Committee, and the time fixed according to the locality selected, within certain limits.

MR. NEWMAN—My desire is to have the limit extended a little later so that we can get you down to New Orleans when it is desirable to come there.

THE PRESIDENT—This is an important matter. The third Tuesday in October has become the fixed time for our meeting, having followed it for so many years, and street railroad men make their arrangements to get away at that particular time. It is an important matter and we should like to hear what you have to say now, or forever after keep your peace.

MR. BACON—I think it would be best to leave the meeting time of this Association just as it has always been, the third Tuesday in October; and then, at each Convention, when we decide where we are to meet the next year, such

action can then be taken, as to the meeting time, as may be desirable, and everybody's arrangements may be made accordingly. It seems to me, if you extend the time from the middle of September to the middle of December, it may interfere with the arrangements of many members who may want to attend the meeting, and it would be necessary for them to know the meeting time of the Convention some time previous. I believe the third Tuesday in October should be retained; and if we meet where it is hot or cold, and it is necessary to change the date, the time can be decided on a year in advance.

Mr. Newman—My object is not to change the usual custom of this Convention, but I want the by-laws so fixed that if this Convention should decide to go to New Orleans, you will not have to propose an amendment, and lay it over for a year, before you can decide to go to New Orleans at a seasonable time. There is no objection to leaving it as it is; but our desire in making this change now, is that we do not want to put this body to the trouble of passing another amendment, which would have to be proposed and laid over for a year; and I suggest that it be made now, to avoid that trouble in the future.

The President—The second amendment, as agreed to by the gentleman who offered the first amendment, now extends the time from the fifteenth of September to the fifteenth of December.

Mr. Davis—The exact date is subject to the direction of the Executive Committee, and the Executive Committee must notify the members on or before the first day of March of the same year. The discretion must be exercised before the first of March, and the members notified, which, in my judgment, would give them ample time to make the necessary arrangements.

The amendment, as finally amended by Mr. Newman, was adopted.

The President—We have just coming into our meeting a body of young men who have been in session in the room below all the time we have been in session. It is the Ac-

countants' Association. It is the new branch of this Association, of which I spoke in my opening address. They are young men; they are hustlers. They have come here for business, and they have attended to it, and they have set us an example that we will do well to follow, in their earnestness and intentness upon their work. I guarantee that they will carry away from here better and more lasting results than we have carried away from any convention we have ever held. [Applause.] Let us help them and encourage them to carry out their plans in every way we know how. I have the pleasure of introducing Mr. C. N. Duffy, of St. Louis, the first vice-president, Mr. Henry L. Wilson, of Boston, the president, having been unavoidably kept at home.

REMARKS OF MR. C. N. DUFFY, FIRST VICE-PRESIDENT OF THE STREET RAILWAY ACCOUNTANTS' ASSOCIATION OF AMERICA.

Mr. Duffy, St. Louis—Mr. President and gentlemen, we want to thank you for the honor conferred upon us in inviting us to appear before this body, and we assure you of our appreciation of it. We want to thank Mr. McCulloch for his kind mention of our Association in his address, and above all, we want to thank the members of this Association for the strong resolutions of endorsement and hearty support that you have passed. That means to us a great deal, more than you probably realize; and in that connection we want to thank all the gentlemen who have come to our meetings, and those who have joined our Association, and more especially those who are managers and not strictly accountants. The Street Railway Accountants' Association was organized in Cleveland, March 23-24 of this year. The work of the accounting departments of street railways is very diversified. It is largely the result of the ideas of the men in charge, or the conditions under which the road is operated, and we feel that it is wise for us to have a convention and better our work and learn from one another, just as you operating gentlemen have done in this convention, and

that is our purpose—to acquire information from one another and interchange ideas, and to bring out the good points of all systems of accounting, for the common good; also to attend these conventions and to profit by the exhibits and other advantages which you gentlemen enjoy. We desire, if possible, to promote a simple, concise and elastic system of accounting, which will be economical and uniform, so that as far as possible all street railway accounts shall be on the same basis. That does not mean that I am to know what the other man is doing, or the other man is to know what I am doing; but it does mean that, if our general managers want to know how they stand as compared with other companies, in the performance of the power plant, or operation of the road, or maintenance of track, or any other department of the work, they can at least compare things on a uniform basis. [Applause.] That is our idea. We feel that the accounting department of a street railway company is just as important as any other department, and all we hope to do is to improve our work and improve ourselves in the same way and by the same means that the American Street Railway Association is helping the operating department. Gentlemen, I thank you. [Applause.]

The President—I hope that you will not think that we have been greedy in St. Louis, because it is more a matter of accident than anything else that the presiding officer of the Accountants' Association and the presiding officer of this Association come from the same city and company. [Applause.]

Mr. Dimmock, Council Bluffs—St. Louis deserves it.

The President—Gentlemen, have you anything you would like to say in connection with this matter? If not, we will proceed with the regular business of the meeting. My object in bringing these gentlemen before you is to let you see who they are and what they are, and let you know what they are doing, so that you will approve of it and encourage them in their efforts.

Mr. Duffy—In connection with what the President has said, I would like to say that to-day we have an all-day

session. We started business this morning at ten o'clock; I cannot say when we will get through. We expect an all-day sesion, and possibly an all-night session. We are now discussing the report of the committee on recommendations for a uniform system of accounting; there are so many questions connected with that subject, that all you operating gentlemen are interested in, and in which you can help us, that we earnestly ask you to come to the meeting to-day and assist us in our deliberations. In that connection I will say that Mr. Sergeant, of the West End road, and first vice-president of this Association, dropped in at the meeting this morning; I happened to see him as he was about to go out of the door. I asked him to address the meeting, and he gave the gentlemen present the benefit of a little talk, a few ideas of his own, with reference to accounting, and we would be glad to have as many more of you as will honor us do the same thing.

Mr. Jones, Memphis—As I understand it the Accountants' Association is made up of the representatives of different street railroad companies or the railroad companies themselves, and if that is the case I suppose they want the membership as large as possible. They have certain expenses to meet, the same as our Association; and it seems to me it would be a good idea for our President to explain the objects of their organization and give some of the members of this Association an opportunity to join the Accountants' Association. Our company is not represented at their meeting, but I will say that we would like to be enrolled as a member. If we cannot send some one to represent us, we will take the benefit of their work from reading the proceedings of their meetings.

The President—I will say in response to Mr. Jones that I happen to know that a circular announcing their meeting and explaining the objects of the Association was sent to every street railway company in the United States and Canada.

Mr. Jones—There are lots of waste-paper baskets, Mr. President.

THE PRESIDENT—Their doors are open, and they would be glad to welcome the membership of any street railway company in America.

MR. DUFFY—Permit me one word more, Mr. President. I will state, Mr. Jones, in answer to your question, that the railway company is the member, as in this Association, and the company is represented by delegates. The annual dues are ten dollars.

MR. JONES—You can put us down anyway.

MR. DUFFY—I thank you, Mr. Jones.

THE PRESIDENT—Mr. Dimmock wishes to address a few words to the Convention.

DISCUSSION AS TO RATES RECEIVED FOR CARRYING THE UNITED STATES MAIL ON STREET RAILWAY CARS.

MR. DIMMOCK, Omaha—The directors of the Omaha and Council Bluffs interurban line, which I represent, have asked me to endeavor to obtain discussion at this meeting of the Convention on the subject of United States mails, as to the amounts to be received from the Government for carrying the same, with the object in view of obtaining better rates, and a uniform price for the same, feeling that through the Convention channels is about the only way the street railways can obtain fair receipts from this class of service. We do not feel that we can get this subject before you so that you can do much at this meeting, but our experience is that the Government is reducing the rates in our vicinity, fifty per cent. of what we have received for the past five years; and upon making inquiries of a number of other roads, we find that they have also decreased their receipts from this source. It appears to me that there is no way in which we can do anything with the Government upon this subject except to get it before this Association; and I think within the next year, if all the members will take this question up, the street railway companies can obtain much larger revenue from this source than they have had heretofore. All I ask is that this subject be taken up and handled between now and the next Convention, so that we can find out what rates we can obtain.

I do not think that the street railway companies are under any obligation to the Government to carry these mails at a less rate than the steam railroads receive, and in a great many cases they are doing so.

Mr. MacFayden, Chester—Why would it not be a good idea to appoint a committee to investigate the subject of carrying United States mail on street railways, and have the committee report at the next Convention?

The President—Would it not be well to have the incoming Executive Committee provide for a paper on that subject?

Mr. MacFayden—I move that a paper be prepared on this subject to be presented at the next Convention.

Mr. Hield, Minneapolis—The route of our interurban line, which runs between Minneapolis and St. Paul, passes the post-offices in each city, and this line has been for several years past the official mail route. To each car a box is attached, in which, in addition to the regular dispatches of mail between cities, letters may be deposited at any of the regular stops on the line.

At the time this service was inaugurated there had never been any legislation covering such service and in order to give the scheme a trial we accepted the lowest classification which was given to railroads and which, I believe, is limited to two hundred pounds. As we carry nothing but letters our weight is never anywhere near that amount. The package mail which goes direct from one post-office to another, is dispatched every thirty minutes.

Our original contract covered a period of some four or five years and has recently been renewed. We have never been quite satisfied with the remuneration we were getting for this service and in our last contract it was considerably increased.

In addition to the above we carry the mail to four substations in Minneapolis and from the Minneapolis post-office to another independent post-office, not a sub-station, located in the suburbs. The remuneration for this last service is on a basis of three cents a mile. This is pouch service, no

boxes being attached to these cars, and dispatches are made at different intervals throughout the day.

Mr. Dimmock—Mr. Hield's remarks go to show that the Government is making contracts in one part of the country that are different from those made in another part; and also go to show that the subject is one which can be discussed among the members of this Association with advantage to the street railway companies. I know of a number of roads where the rates have been reduced, and Mr. Hield says their rates have not been reduced, which shows that there is discrimination in one way or another. I think in view of the shortness of time this morning, it would be well to have a report presented on this subject at the next meeting, when the matter can be taken up for discussion.

Mr. Hield—I think I am safe in saying that the Government representatives drive as good a bargain as they can—somewhat the same as other business men. The representative who negotiated for our service was not bound by any set limits. He was to do the best he could, and we got all we could. He had no fixed basis to go on, and that is their argument, that there is no legislation covering the subject.

Mr. Jones, Memphis—Our experience has been a little different from that of Mr. Dimmock. We carry mail to a number of sub-stations, and within the last thirty days the Government notified us of about fifty per cent. increase of the amount which it allows us, without any solicitation on our part whatever.

The President—I will state what occurred on one of the roads in St. Louis, which has for a long time been carrying mail from the city out into the different sections of the county. The contract expired a year ago. The company was not satisfied with what it had been getting, and the Government declined to increase the rate. It ran the mail car into the car house, and there was such a demand for the mail service, that the Government immediately made satisfactory arrangements.

Mr. Hawken, Rockland, Me.—A representative of the

Mail Department in Washington came to Rockland and made arrangements with the Rockland, Thomaston and Camden Street Railway Company, allowing us the same rate as steam railroads for carrying the mail. We have an apartment fitted up in a car for carrying open mail, another for baggage and express and a third for passenger service. The United States Government pays a part of the salary of the postal clerk, who also serves as baggage and express agent and as conductor of the car.

MR. DIMMOCK—From the fact that the Government cannot compel the railroads to carry the mails at their price, arbitrarily set, it leaves the question open for the members of this Association, who represent nearly all of the prominent street railroad companies throughout the country, to have this remuneration placed nearly where it has been heretofore; and I am positive that the greater part of the compensation in the past has been larger than that now paid; and, therefore, it is in the power of the members of this Association to secure a more equitable price for this service.

The motion of Mr. MacFayden was put and carried.

THE PRESIDENT—We will now proceed to the regular order of business, and take up the paper on the "Discipline of Employes," by Mr. George H. Davis, Superintendent, Canal and Claiborne Railway Company, New Orleans, La.

REPORT OF THE COMMITTEE ON "DISCIPLINE OF EMPLOYES."

MR. DAVIS read the paper, as follows:

SYNOPSIS.

1. Introduction and definition of railway discipline.
2. Principles of discipline:
   (a) Confidence of employes.
   (b) Fair dealing.
   (c) Organization and classification.
   (d) Issuance of orders.
   (e) Employment to full capacity.
   (f) Vigilance.
3. Civil Service offered as a suggestion and partial solution of questions of discipline in railway operation.
4. Civil Service methods as employed by the Government.

5. What features a successful Civil Service method should include.
6. General questions of employment and promotion, according to Civil Service methods.
7. Civil Service methods employed by the Canal and Claiborne Railroad Company:
   (a) System of marking.
   (b) Principles of same.
8. Application of Civil Service methods to large railway systems.
9. Results of competitive Civil Service.
10. Conclusion.

Mr. President and Gentlemen:—Discipline is universally recognized as a necessity in every important industrial undertaking. It is as thoroughly essential to success in the operation of railways as are the plans and specifications in their construction. In the broad sense it means the government of operatives through whom the equipment is made to do its work, and the efficiency of the equipment varies in direct ratio with the efficiency of its operatives.

A road has good discipline when all employes respect and kindly regard each other; when the officers do their best for the men, and *vice versa:* and when both officers and men sacrifice everything to the interests of the company.

It is a somewhat difficult task to maintain the conditions as defined, but the nearer this standard is approached, the greater the surplus earnings.

Discipline should never be interpreted in the narrow sense that a man is to work as a machine. It is true that cars should "run like clock-work" but, to arrive at this result, through the constantly changing circumstances that arise, requires the services of men of thorough training, presence of mind, and good judgment.

There is no fixed method of maintaining good discipline. It is frequently the result of the personal characteristics of the man in charge. There are, however, certain principles which are probably of universal application. First of all, a railway manager must gain the implicit confidence of his officers and men. To do this, he must, in general, know the details of the design, construction, operation and maintenance of railways. He must have a universal reputation among his men of being shrewd, vigilant, industrious, honest and perfectly fair in his dealings. He must know them all personally, stand by them, and respect them as gentlemen upon all occasions. He must be thoroughly popular and able to create among them a spirit of loyalty and enthusiasm in regard to the road and its interests.

A thing of greatest assistance in discipline is complete organization. Every man engaged in railway operation, from president to track-greaser, should have before him in printed form, a full synopsis, outlining all the essential features, the exact limit, scope and character of service that he is to render.

All officers should have their exact relative rank in the service, which should be thoroughly known among all employes. In this way, if conflicting oral orders are given, the order given by the officer of superior rank will be obeyed without question.

Another feature of discipline is the issuance of orders. Many failures to obey orders are due to a misunderstanding or misinterpretation. It is, therefore, important in railway operation, to issue all orders in printed form, clearly and definitely stated. These orders should be sent in explanatory personal letters to all superintendents, foremen, inspectors and starters, and be published on conspicuous bulletin boards at all stations. An order should never be issued except that it meets with the approval of the best officers and men, and, after once issued, it should be an infallible law, applicable to all employes alike, and, if broken, it should in all cases be followed by a prompt and severe penalty.

Satisfactory discipline cannot be maintained unless employes in all ranks are worked to their full natural capacity and physical strength. Idleness and easy positions in railway operation will undermine the best system of government that could be established. Again, constant watching is a most important factor. The manager, or whoever is responsible for the receipts, expenses, maintenance and discipline, should spend at least eight hours a day on the lines of the company. There should be trusted starters at both ends of all lines at all times, and at least one inspector for each thirty cars operated.

Written reports for the smallest details of both good and bad features of the service should be insisted upon from all officers of the company, and a false report from an employe should be sufficient cause for his instantaneous discharge. Nothing good or bad in a man's service should be passed without the manager's recognition. One of the strongest incentives to good work among men who are trying to do their best is praise. When a motorman saves a pedestrian from mutilation or death from an electric car, his act should be recognized by a complimentary personal letter thanking him for his skillful work. In general, a manager should have only praise for his officers and, among the men, ninety per cent. of them should be above censure. However, when a man is censured it should be severe, and the final preliminary to his discharge. A man should never be discharged, except his case is given thorough investigation and he is given abundant opportunity for defense. When he is once discharged he should never be reinstated.

Railway employes, as a rule, admire a policy which is open, fair and generous. When an unusually large day's work is done in handling a great crowd of passengers, it is no more than fair for the company to share its profits with the men, giving them a few hours extra time, the number of hours being in proportion to the extra receipts. The amount of money thus invested will in the future return to the coffers of the company a hundredfold and more.

Perfect management is something beyond human effort, still, if the

problem is earnestly and industriously studied, railways may be operated to the complete satisfaction of the public, the stockholders and the employes.

As a partial solution of the different questions arising in connection with discipline, a competitive Civil Service System is offered as a suggestion. There are no new principles in this system as commonly understood. It is only a way of carrying out what every successful man has always followed in his business career. He selects the man whom he believes most efficient. He promotes the man who is of greatest service to him, and discharges the man whose services are of the least value.

All civil service methods employed by the Government take account only of a man's ability in successfully passing the initial examination. In reality a man's work in the service, after employment, should have far greater weight in regard to his retention or promotion than the mere fact that he was able to answer correctly a series of questions, at best having only an auxiliary connection with the work to be performed. Another serious weakness in Municipal or Government Civil Service methods is that often questions are prepared and answers examined by commissioners who know nothing of the business, trade or professsion for which they are conducting the examination. In all cases questions should be prepared and examinations conducted by the head of the department under whom the candidate is to work after entering the service. To insure perfect fairness commissioners may be delegated to criticise the questions, witness the examinations, and judge of the relative merit of all answers. Any successful competitive civil service system for railways must take into account:—

1. The previous history of the applicant, including his railway experience.
2. His knowledge and skill in railway operation, which is covered by competitive examination.
3. His physical condition.
4. The quality of his work after entering the service.

The quality of his work after entering the service is the best criterion by which to judge of his relative value. However, before a man is employed it is impossible to judge of his work, and the only alternative is a broad, practical, competitive examination, which covers a sample of his work under the observation of the examiner, together with answers to the most practical questions that may be framed.

In applying these methods to railway operation and maintenance, it is necessary, so far as practicable, to classify the positions of each of the various departments, so that there is a fixed line of promotion from the lowest to the highest rank. This does not mean that a man shall have worked in all ranks of a given branch of the service, or even in all branches of a given department. It does mean, however, that he

shall have started at the lowest round of the ladder in some one branch, and have learned some one department to *perfection*, and all departments in general. Railway companies vary widely in their classification of positions, and the relative value that they attach to the services of each department. It is not intended, at this point, to discuss the organization of railway operatives.

A classification, so far as civil service methods are concerned, may be compared to a river and its tributaries where the waters of all branches, if they are not evaporated, may reach the desired terminal. In short, it is a question of all being given an opportunity, and the survival of the fittest.

There are, apparently, some difficult features in the general policy of promoting men according to their relative standing, from one department to another, or even from one branch to another of the same department. The skill and experience required in one may be totally different from that required in another, and again, a man may show marked ability in one position, while in another he would prove most inefficient. However, if a man is industrious, bright and faithful in one position, he will maintain the same characteristics in another, and, as every practical man knows, these qualities of character in an employe are more desirable than all others.

A competitive civil service system, if correctly applied, is a most advantageous solution of the question of advancement of employes, and does not interfere with a practical line of promotion. For example, if a vacancy occurs at the head of a given department, all employes ranking highest in the various branches are eligible to compete for the position. In deciding upon the successful candidate two things should be taken into consideration, the previous standing and record of the competitor with the company, and the result of the competitive examination.

In all departments of the Canal and Claiborne Railroad Company employes are placed upon a basis of competition. Men are employed who have the best standing according to a broad, competitive examination, and are placed in the lowest rank of any given branch of the service.

Promotions in the various branches, so far as practicable, are made consecutively from one rank to another. The company fills every position from among its own employes, provided there is any one in the service competent to take the place. To illustrate, if the position of chief dispatcher were vacant, all starters employed by the company would be eligible to compete for the position. The chief dispatcher prepares all schedules, knows the exact position of every car on the road, and the crew that is operating it. Now, if upon competitive examination it were found that no starter employed by the company was able to prepare a thoroughly practical, satisfactory and economical schedule, then no one in the direct line of promotion would be given the position. In this case, another examination would be held in which

employes of all departments would be eligible, together with the employes of other companies or outside persons. In this way merit alone is recognized as a basis for advancement, and also the highest standard of efficiency is maintained in the various positions.

So far as practicable, the same regulations apply to the transportation department, the maintenance department, and the accounting department.

In the transportation department, in the employment of motormen and conductors, when an applicant presents himself, if he is worthy of consideration, after a preliminary conversation and inspection, he is given application and recommendation blanks.

To be eligible for appointment as motorman or conductor the applicant must be between the ages of twenty-five and forty years; for the position of motorman he must weigh at least one hundred and sixty pounds, and not exceed two hundred and ten pounds, and must be at least five feet eight inches in height. He must have had at least one year's experience in the position he seeks, and should be recommended to the service by at least three officers of the company, including foremen, inspectors and starters, and also by at least seven motormen and conductors who are already in the service. He then obtains the certificate of the company's physician with regard to his physical condition. If his certificate, application and recommendation fill the requirements and are apparently satisfactory, they are then given to an inspector who personally investigates his previous record among the employes with whom the applicant has worked, and also among outside persons who know the applicant. If the inspector's report of investigation is satisfactory, the applicant is placed on the lines of the company with motormen and conductors who have the best standing in the service. He rides with these men until he is familiar with the special features of the lines of the company. He is then given a competitive examination. This is intended to be extremely practical and consists of two parts:

1. The applicant takes charge of a car, with an inspector, who estimates the quality of his work over each line of the road, for one trip.
2. He answers a list of questions covering the various things connected with this department of railway service.

Finally, the applicant presents himself at the office of the manager, where he is questioned in regard to all orders and instructions previously issued by the company, and his understanding of the conditions under which he will be expected to work.

Based upon the above, applicants having the highest standing are given positions as extra motormen and conductors as fast as vacancies occur.

If inexperienced men are employed at all in the service, they are taken on as conductors and kept in this position for at least six months, and for three months they work without pay. After this work as con-

ductors they "break in" as motormen, with motormen already in the service who have the highest standing.

After six months' service of this kind they are given their examinations, and are placed on the lines of the company as extra motormen.

To determine the relative standing of employes a system of marking has been adopted, which takes into account:

1. The general quality of a man's work according to the judgment of the foremen in charge.
2. The value of the special acts in his service, as reported by foremen, and marked in the record of the employe according to a fixed scale kept in the main office.

To illustrate, in the department of transportation, for motormen and conductors, blanks are prepared which contain the names and numbers of every motorman and conductor in the service. At the head of these blanks there is a personal letter, addressed to the manager, which is as follows:

"*Dear Sir:*—According to my best judgment the quality of service rendered by each empolye coming under my observation, in my department of the service, being fairly and honestly estimated for to-day, is as follows:"

After the name of the motorman or conductor there is a blank space left for the mark of the foreman. Each foreman, inspector and starter has one of these blanks, and marks after the conductor's or motorman's name the quality of his work for the day, and sends the blank to the main office the next morning. He marks "v e" for very excellent; "e" for excellent; "g" for good; "f" for fair; "p" for poor, and "v p" for very poor.

In the main office these marks are reduced to an arithmetical basis and placed on the records of the employes. In determining the marks to be placed in the record, the marks of all foremen, inspectors and starters for a given man are added and the mean taken, which is considered the final mark. In this way the average judgment of perhaps ten different foremen in regard to an employe's work is obtained.

The marking of the special acts of an employe is on a more definite basis, and has no connection with the judgment of the foreman, inspector and starters. They simply report the acts, based upon bulletins, instructions or orders issued, and also upon experience in good railway practice. Two lists of acts of employes are made; one delineating all the desirable or commendable features of the service of an employe and the other all the undesirable or intolerable features. For each of the acts in the commendable list, a certain number of points of merit are always given. Similarly, for each of the acts in the undesirable or intolerable list, a certain number of points of demerit are given. To illustrate more thoroughly, a few of the acts mentioned in the merit

and demerit list may be given. In the merit list for motormen we have: Skillfully avoiding accidents. Assistance in minor road repairs. Suggestions as to best speed of cars. Helping to clear blockades. Assistance rendered on special occasions. Obtaining names in accident cases, etc., etc.

In the demerit list for motormen we have: Running with hands off of brake and controller. Looking around while car is in motion. Not running on schedule time. Feeding car too fast. Untidy condition of dress. Accident to persons (serious, medium, or slight injury). Accident to cars (serious, medium, or slight injury). Accident to vehicles (serious, medium, or slight injury), etc., etc.

In the merit list for conductors, we have: Complete and perfect accident reports. Reports as to where the company is gaining or losing traffic. Reports as to what passengers say. Kindness to aged or infirm persons. Assistance rendered on special occasions. Obtaining names of witnesses in accident cases, etc., etc.

In the demerit list for conductors we have: Incomplete accident reports. Insufficient number of names in accident cases. No change. Not announcing route, streets or transfer points. Leaning against door conversing with passengers inside of car. Short register. Bunching fares. Ringing up fares when officer boards car. Register not turned. "Shorts" and "overs." Untidy condition of dress, etc., etc.

The marking for general daily reports, together with reports of special acts, is kept in a record book, which allows four pages to each employe, each of the pages being numbered to correspond with the employe's badge number. The first two pages of each employe's record are made up in blank form, allowing spaces for each day of the month, together with each month of the year. The next two pages are plain ruled and are used for explanations of marks given.

The margin of the first page is divided into blank forms, giving the information regarding an employe which is usually covered by headings placed in application blanks. Each month the points of merit and demerit are balanced. If an employe's record falls below zero he is discharged.

The estimation of the value of a man's services according to the above method is based upon two foundation principles, one being a check upon the other. Every officer of the company has his own ideal, and due to the fact that every human being sees the world from a different standpoint from every other human being, the chances are that if an employe's work is estimated upon by ten thoroughly experienced railway operatives, the average judgment of these men should be correct. Acting upon this principle favoritism among officers is almost completely eliminated. Some men might be favorites with two or three officers due to outside circumstances, but this would never extend to the whole ten, or even five. A car operative's life is not filled with opportunities to render brilliant services in behalf of his company, and

for this reason some method of estimating his work must be adopted which will give credit for every day's efficient, satisfactory conduct. The method employed has proven by experience to be simple, just and effective.

The second principle used in the estimation of the quality of the service is embodied in the fact that a more just and unbiased decision can be reached in regard to the merit or demerit of an act if judgment has already been passed on an exactly similar case. Now, by the system of marking mentioned, a list of all possible cases is prepared and judgment passed upon them by the general officers of the company, the relative number of points of merit and demerit being fixed. Now, when an act occurs, it only remains to locate it in the list to pass judgment. Hasty or snap judgment passed in a fit of anger on an employe's offense, usually results in the greatest of injustice to the employe. The reaction among employes is such as to practically destroy their confidence in the company, and always proves detrimental to the best interests of the road.

Promotion among motormen and conductors is always made according to their standing as determined by their records, without examination. The "extra" motorman or conductor having the best record is promoted to a "swing" run. Similarly the swing men to "half and half." Half and half men to "straight day" runs, and straight day motormen and conductors are promoted to the positions of inspector, starter, or transfer agent, on their records alone. No account whatever is taken of the relative date at which an employe entered the service.

As mentioned before, the same general methods are employed in all departments, but, owing to the fact that the transportation department is the most important of all, the details of the civil service system are carried out most thoroughly in this connection.

To insure perfect accuracy and fairness, each employe is invited to examine his own record or that of any other employe at any time. He is also at liberty to inspect the scale of marking, by which the records are adjusted.

It is evident that a system of bookkeeping resulting from the methods as described would be more expensive to maintain than other forms of discipline which have been generally employed. It has been found, however, that the extra expense attached to this system is trifling in comparison with the results obtained.

The larger a street railway the more thoroughly applicable are civil service methods. This comes from the fact that, on small roads, the general officers of the company come more in contact with the employes, thus being able to judge personally of the quality of their service, regardless of records kept, and too, on small roads, the same employe may fill several positions, in comparison with a thoroughly classified organization, which must be maintained in large street railway systems.

Regarding the general results of a thoroughly enforced competitive

system, it may be stated that there is as much difference in the quality of work rendered by men engaged by a road operated on a competitive basis of promotion, and a road on which promotions are made according to the position of a man's name in the list, as there is between two railway companies, one having a monopoly of the traffic and the other having a direct paralleling competitor. It has been found by experience in the operation of roads, where employes work on a competitive basis, that they invariably do their best. They are gentlemanly in their treatment of passengers, neat and tidy in their dress, and skillful and prompt in the discharge of their duties. They take great pride in the company's fine equipment, its large business, its management, and principles of fair dealing. They never fail to praise the company and its service to patrons, and are only too glad to answer in behalf of the company any adverse criticism offered by patrons or the public. They feel from the start that their present and future positions in the railway business depend on the quality and quantity of their work and nothing else.

Legitimate competition is one of the most powerful incentives that can be employed. Men under these conditions are forced to make their best efforts. This is illustrated constantly in all professional, mercantile and manufacturing industries. The piece-work system in vogue in New England factories is only one method of competition by which a man is paid according to the quantity and quality of his work.

On a competitive basis the standard of excellence is constantly being raised. When a large number of men are engaged in the same kind of work, there are always a few who will accomplish most extraordinary results, and their work stands as a most effective object lesson to the others. If a man has anything in him competition will bring it out. If he has no redeeming features then his services are not required.

Another advantage of the civil service system is that it effectually debars all outside influence and eliminates the "bug-bear" commonly designated among the men as a "pull." It also completely obliterates political interference, which is the greatest bane to the efficient services of American street railways.

In conclusion, it may be stated that this system is not urged as a panacea for all the ills of railway management, but is only offered as a suggestion with the hope that it may be of some slight assistance in improving the successful methods which have always been employed.

Respectfully submitted,

GEORGE H. DAVIS.

THE PRESIDENT—You have heard the paper read by Mr. Davis. What action will you take upon it?

Mr. RIGG, Reading—I move that the paper be received and filed, and the thanks of the Association returned to Mr. Davis. Carried.

THE PRESIDENT—Are there any questions to be asked Mr. Davis? I expect that he is ready to answer them.

If there is to be no discussion on this paper, we have a report of the Committee on Rules for the Government of Conductors and Motormen.

REPORT OF THE COMMITTEE ON RULES FOR THE GOVERNMENT OF CONDUCTORS AND MOTORMEN.

THE SECRETARY read the following report:

THE AMERICAN STREET RAILWAY ASSOCIATION,

Gentlemen:—Your Committee, appointed at the annual meeting of the Association in St. Louis, in 1896, to consider the advisability of this Association adopting a standard code of rules for the government of street railway employes, beg leave to report, that after a careful consideration of the subject, we deem it both necessary and desirable that such a code be adopted by this Association, and, therefore, recommend that a committee be appointed to formulate such a code of rules and report the same in full at the next annual meeting of this Association. The Committee, in thus reporting in favor of the adoption of such a code of rules, wishes to disclaim any intention of desiring to make the use of such rules obligatory on any member of the Association, but desires that, if such a standard is adopted by this body, it be left to the discretion of the members to adopt it for their roads in its entirety, or select such portions as in their judgment is applicable to their local conditions.

Respectfully submitted,

W. F. KELLY,
IRA A. MCCORMACK,
E. C. FOSTER,
Committee.

MR. PRESIDENT—It looks to me as if this committee wanted to get somebody else to do the work the Association detailed them to do.

MR. KELLY—Mr. President, it was my understanding that we were to prepare such a code of rules; and, as far as I am concerned, personally, I had a number of suggestions which I desired to have incorporated in such a code. On the meeting of the committee, however, it seemed to be the judgment of several of the members that it was not our duty

to prepare the code, but to report upon the advisability of recommending the adoption of such a set of standard rules by this Association. With that view of the subject we did not prepare any rules; there was a difference of opinion as to what we were to do in this matter. For myself, I will say that it was my understanding that the committee was to prepare a set of rules and submit them to this Association at this meeting, for approval or rejection, and I hope that the committee will be directed to make such a report.

Mr. Akarman, Worcester—I move that the report be accepted and the same committee be continued for another year, with instructions to report such rules to the Association. Carried.

The President—The next order of business is the presentation of a paper on "Application of Electricity to Railroads Now Operated by Steam Power," by Mr. N. H. Heft, President, Meriden Electric Railroad Company, Meriden, Conn.

REPORT OF THE COMMITTEE ON "APPLICATION OF ELECTRICITY TO RAILROADS NOW OPERATED BY STEAM POWER."

Mr. Heft read the report, as follows:

Mr. President and Gentlemen:—The New York, New Haven and Hartford Railroad Company owns and controls about 2,800 miles of main line railroad track in New York, Massachusetts, Rhode Island and Connecticut, of which about 16 miles are operated by electricity on the third rail system and 14 miles on the overhead trolley system.

The company also owns the entire capital stock of the Stamford Street Railroad Company and the Meriden Electric Railroad Company, the former operating about 10½ miles of track and the latter about 17½ miles on the overhead electric system.

It is through my official connection with the Meriden Company that I am permitted to be present at the meetings of the American Street Railway Association, a privilege which I thoroughly appreciate.

Electric railroading on a large scale is but the development of street railway experience, and, if the future brings success in the efforts now being made to use electricity for heavy work, it will be due, largely, to the courage and enterprise of those who have "blazed the path of progress" and forced the fighting by entering into competition with an industry which believed itself, ten years ago, absolutely secure in its position.

There is little for me to tell you of novelty in the work done by the New Haven Company in Meriden and Stamford. These are ordinary street railway systems, fairly well equipped, and we try to operate them to serve the public properly. Believing, as we do, that a good track is the foundation of a good system, we have thoroughly reconstructed the track in both cities with heavy rails. In doing so we have paid the most careful attention to the matter of return circuit, bonding the rails so thoroughly as to make them the path of smallest resistance back to the station. We have thus avoided, to a very large extent, trouble with electrolysis. Nothing is more certain to my mind than that carelessness about making a track return circuit is a most serious mistake, and that carelessness about testing and maintaining joint connections is another. I would rather spend a thousand dollars or more in providing ample carrying capacity of rail bonds than to put the same amount of money into the overhead circuit, if, by doing the latter, I should neglect the former.

About three years ago, the New Haven Company found that various electric railways in its territory were gradually extending their operations into the field of interurban work, and that the company's passenger earnings were suffering accordingly. It was at once seen that, by no ordinary methods of changing schedules or increasing speeds, could this lost traffic be won back again, and, with characteristic knowledge and courage, President Clark and the New Haven directors determined to "steal the thunder" of its new competitors, and commenced a series of elaborate experiments in heavy electric railroading. It must be confessed that this decision was reached only after some misgivings. To the average steam railroad man, street railways have, until recently, seemed a pretty sort of toy, fit for apprentices in the art of transportation. Latterly, however, he has waked up to the fact that "the tail will wag the dog" unless some radical action is taken, particularly in suburban and short distance work, and, in the Eastern sections of the country, anyway, steam railroad men have become modest enough to be willing to look with respect upon the great work which has been accomplished in street railroading.

The first line to be equipped by the New Haven Company was a purely summer road operated for about four months in the year only, through a narrow peninsula running out from the mainland on the Massachusetts coast from Nantasket Junction to Pemberton, a distance of about seven miles of double track. This line was chosen partly because the main line operation would not be interfered with in case of trouble with the electric trains and partly because of the existing heavy summer traffic, which would put the new apparatus and the feasibility of the entire system to a severe test. An overhead trolley line was built, with center pole construction, and everything made very strong and more substantial than was at that time found in any street railway work to our knowledge. At the time of construction of this overhead

line, there were no suitable movable switches in the market, and we had to remodel and have built especially for our purpose those which we finally adopted. One feature perhaps worthy of note is the connection of the overhead switch with the track switch in such a way that both are controlled by a single lever at the switch stand.

The line was operated for the first summer with excellent success, and, all fear of trouble having disappeared, an extension of 3.6 miles was made on the main line of the company's Plymouth division, from Nantasket to East Weymouth, this section being operated by the third rail system.

In December, 1896, we commenced work on a new line running from Berlin, Conn., through New Britain to Hartford, a distance of 12.3 miles, three miles of which, from Berlin to New Britain is a double track, and the remainder, from New Britain to Hartford, a single track. A power station was built at Berlin, one end of this line, partly because of a desire to test transmission of power to a considerable distance, and partly because Berlin is the center of several radiating lines which may eventually be put into operation by electricity.

The physical characteristics of both these lines have been so carefully and accurately described in technical papers that I shall only refer to them more or less incidentally in the following, confining my remarks chiefly to the results which we have found, and the conclusions which we have reached in our own minds, as to the best methods of applying electricity in heavy railroad work.

TRAIN SERVICE AND TRAFFIC.

We have learned very thoroughly, in our street railway experience, the lesson of the importance to any transportation agency, working in a thickly populated territory, of uniform fares and a frequent and regular train service—of a train service which requies no printed schedule to enable people to know when cars may be found in waiting. The time has come when every progressive railroad manager must recognize that new conditions and the new character of competition require a complete change of operating methods.

On its Nantasket Beach line, the New Haven Company gave, during the last summer, a regular half-hour service from 6:30 in the morning until 11:30 at night. When unusually heavy boat loads arrived at Pemberton from Boston, trains were run in as many sections as were found necessary to take care of the people, but still the half-hour schedule was not departed from on ordinary days. On Sundays and holidays, when boats arrived at Pemberton every fifteen minutes during the greater part of the day, express trains between Pemberton and Nantasket were sandwiched in between accommodation trains in such a way as to give a fifteen minute schedule of alternate express and accommodation trains. The time table this summer required thirty-three regular trains daily, each way, between East Weymouth and Pemberton. During

July and August, the traffic increased to such an extent as to require six motor cars in constant week day service, and on Sundays and holidays, eleven motor cars have frequently been called for.

The fares charged on the Nantasket Beach line before the advent of electricity were ten cents from Pemberton to Nantasket and eighteen cents from Nantasket to East Weymouth, a total of twenty-eight cents from Pemberton to East Weymouth. With electric traction they have been placed at a uniform rate of five cents from Pemberton to Nantasket and five cents from Nantasket to East Weymouth, a total of ten cents from Pemberton to East Weymouth. Under these new conditions, the traffic has increased enormously on this line; the summer of 1895, the first of electrical operation, showing an increase of 92.6 per cent. over the previous summer in the number of passengers carried; the summer of 1896 showing 45.1 per cent. increase over 1895, while, in the summer just passed, we have carried nearly three times as many passengers as in the last year of steam operation.

The operation of the line from New Britain to Hartford was commenced in May last, with a regular half hour train schedule from 6 in the morning to 11:30 at night, and with a uniform fare of ten cents each way, instead of twenty-three cents, the former charge. The electric line carries through passengers only between Hartford and New Britain, the passengers for the five way stations being carried by the regular steam trains running on a parallel track. For ordinary every day service, a single open motor car was used during the past summer, while for extra loads, light double truck trail cars, seating seventy persons, were attached. On rainy days, a standard close passenger coach was hauled by the open motor car. On holidays and Sundays, the cars pulled two trailers, the entire train seating nearly two hundred and fifty passengers. About the middle of August, steam service on the Berlin-New Britain branch was discontinued, and traffic has since been handled entirely by electricity. Sixteen trains each way per day are run, connecting with steam trains.

Under the conditions named on the Hartford-New Britain line we have carried, during the three summer months, 400 per cent. more passengers than we carried through the corresponding months of last year.

SPEED, ACCELERATION AND SCHEDULES.

I do not suppose that any but a trained railroad man can understand the impossibility of operating trains and maintaining schedules by steam locomotives in the way that has been done by electricity at Nantasket Beach this summer. There are a great many curves on the line, and several grades, as will be seen by the accompanying plan and profile. (See Fig. 1.) There are no excessively sharp curvatures or steep grades, and it is not here that the trouble has come. The difficulty is found in the fact that there are no less than seventeen stations

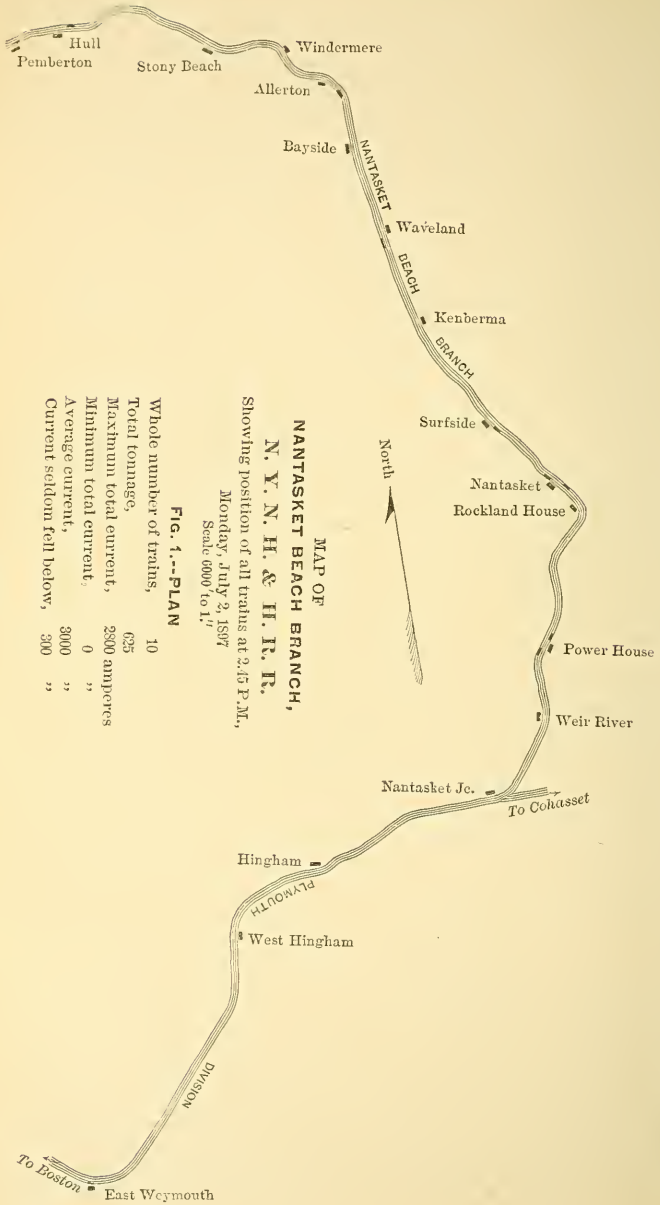

Hull
Pemberton
Stony Beach
Windermere
Allerton
Bayside
NANTASKET
BEACH
BRANCH
Waveland
Kenberma
Surfside
North
Nantasket
Rockland House
Power House
Weir River
Nantasket Jc.
To Cohasset
Hingham
PLYMOUTH
DIVISION
West Hingham
To Boston
East Weymouth
MAP OF
NANTASKET BEACH BRANCH,
N. Y. N. H. & H. R. R.
Showing position of all trains at 2.15 P.M.,
Monday, July 2, 1897
Scale 6000 to 1."
FIG. 1.--PLAN
Whole number of trains, 10
Total tonnage, 625
Maximum total current, 2800 amperes
Minimum total current, 0 "
Average current, 2000 "
Current seldom fell below, 300 "

FIG. 1.

on a line only 10.6 miles in length, or an average distance between stations of but about .6 of a mile. To make a run of ten miles with sixteen stops in twenty-six minutes; to be *obliged* to do this in order to connect with boats arriving at regular half hour intervals and to keep out of the way of frequent regular steam trains on the main line of the Plymouth division; to allow but four minutes at each end for unloading, switching (including running around trail car), and loading; and to do this

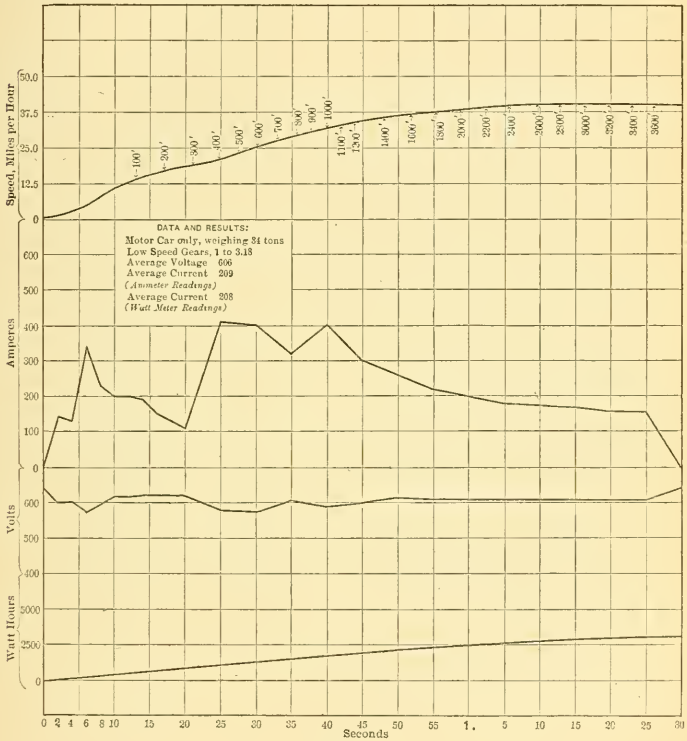


FIG 2.

day in and day out, in regular service, through an entire summer; these are things which cannot possibly be accomplished by steam locomotives.

Now, the reason why electricity can do this and steam cannot, is found in the tremendous accelerating power of properly designed electric motors, with rotary motion as compared with reciprocal motion of steam locomotives. By examination of the curve of acceleration plotted from actual tests of a 60-ton train (see Fig. 2), and of the

practical results shown in the curve of speed between stations in a service run on the Nantasket Beach line (see Fig. 3), as well as the accompanying time chart made up from the company's printed time

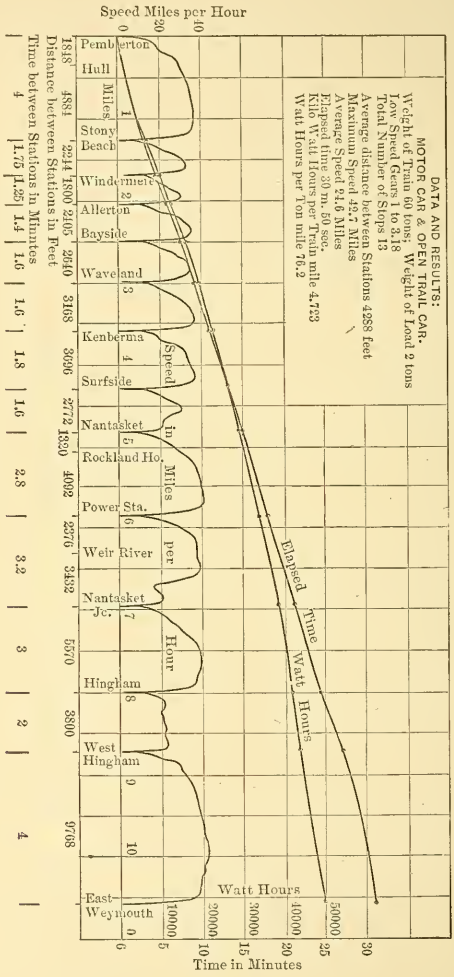


FIG. 3.

cards, it will be seen how enormous is this accelerative power.

It will be seen, for example, that a 60-ton train, in running from Windermere to Allerton, a distance of only 1,800 feet, reaches a maximum speed of thirty-one miles per hour, while in the longer run from

the Power Station to Nantasket Junction, a distance still of but 5,808 feet, a maximum speed of thirty-nine miles is reached. The entire distance is covered, in regular service, at an average speed of 24.6 miles per hour, including stops.

Between Hartford and New Britain, the 9.3 miles distance is covered regularly by motor cars with two trailers in from eighteen to twenty minutes, an average speed of from twenty-eight to thirty miles per hour, while, with a special high-geared motor, a maximum speed of over sixty miles has been made; the entire distance of 9.3 miles being

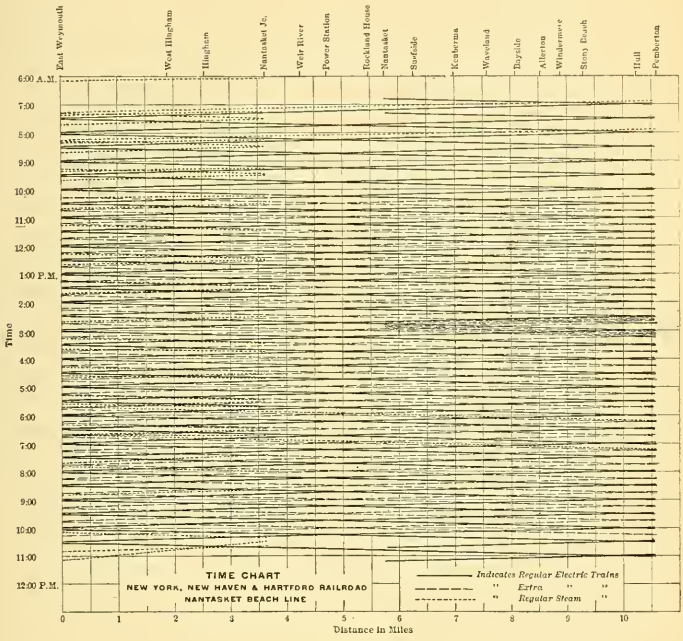


FIG. 4.

covered in ten minutes. The alignment and profile of this road is shown in Fig. 4. On this line, a 52-ton train often reaches a maximum speed of fifty miles per hour. The current is cut off at twenty-nine grade crossings when single car trains are run.

It is worthy of note, in this connection, that the line between New Britain and Hartford is in direct competition with a trolley line between the same points but following a more circuitous route. The schedule time of trolley cars is fifty-five minutes, as against our time of less than twenty minutes, and the rate of fare is fifteen cents (including a transfer

given for use on the street railways of either city), as against ours of ten cents for the straight run between the two cities only. The ownership of right of way has a very important influence upon speed and competitive conditions under circumstances like these.

CARS AND EQUIPMENT.

The type of car selected for any good transportation service has a direct bearing upon the development of traffic and maximum gross receipts. It has been difficult for steam railroads to depart far from the long established custom of closed passenger coaches of the present standard type and to adopt open cars, on account of the disagreeable effect on passengers of the smoke and gases from engines. This has naturally thrown a great deal of traffic to competing street railway lines running open cars in summer, on account of the much greater pleasure in riding.

With electric operation, open cars in heavy railroad practice are possible, even at considerable speed, particularly if the front of the car is closed in with glass, and both at Nantasket Beach and on the Hartford-Berlin line, we have used heavy open cars with great success.

The motor car which we have so far used we do not consider, by any means, the final type, and even now we have in mind plans of combination cars which we believe will be, on the whole, well adapted for railroad work. The present motor car is very heavily built, with floors of a height equal to that of our standard passenger coaches. It contains sixteen cross seats, capable of seating ninety-six passengers, and the entrance is from either side with three steps. Each car has two heavy railroad trucks, one of which is equipped with two 125 h. p. motors. The total weight of the motor car is 32 tons, and the trailer car of the same type weighs 25 tons. The motors which we have used up to date have been of a type common in heavy elevated railway work. These motors have often been in service for several consecutive days, making 324 miles each day, without apparent injury. We found the motors we are using already in the market when we commenced our experiments, and until recently no attempt has been made by us to specify changes. Under these circumstances, great credit is due the manufacturers for their efforts to meet the difficulties encountered. The experience gained with these motors has served as a basis for building larger and heavier types, better adapted for the severe work which they will be called upon to fulfill to meet our requirements. An important point which we shall specify in new motors is that they shall have the most perfect ventilation possible. The efforts of manufacturers have been hitherto directed towards completely encasing the motors, so as to make them water-proof, but in doing this ventilation has been sacrificed. We have found it beneficial to blow out our motors several times during the day, by means of a blast of air from a hose pipe connected to our air brake reservoir, but this is, at best, but a makeshift.

It is very difficult to dispose of all the necessary cables, wires, brake-rods and chains, air brake cylinders and apparatus, switches and other car controlling mechanism in the limited space beneath the car floor, as may be readily imagined by those familiar with street railway work. As a consequence there has always been more or less controversy between those responsible for the placing of the different portions of the equipment, as to who shall have the first right to a given space, perhaps hardly half a dozen square inches in section. There is also more or less trouble with abraded wires, short circuited shoe hangers, etc., and for our future work we are making an effort to simplify this mass of equipment mechanism by putting some of it, particularly the wires and cables, in a space between the true floor of the car and a false floor several inches below, specially provided for the purpose.

For operating heavy trains of this character, where currents of from 500 to 1,000 amperes are sometimes used, the controlling apparatus must be massive and strong in every part, and the greatest care must be taken to prevent arcing. We have had no trouble with controlling apparatus on our regular equipments, and we consider this branch of the apparatus well perfected.

The danger to station and car apparatus from lightning discharges, which is so important a factor in street railroading where the overhead system is employed, is avoided in third rail work, since the third rail is so close to the ground that it is practically a lightning arrester itself throughout its whole length.

The problem of braking, which is so important a one in street railroading, is found more so with us, since the train weights and speeds are enormously greater. The regular Westinghouse air brake system, with engineer's valve, is used on our electric trains, but instead of steam air compressors, we have an electric motor compressor, controlled by an automatic regulator which has given excellent satisfaction.

Our experience with trolleys on the overhead line at Nantasket Beach, originally put in two years ago, has not been satisfactory. We find it quite impossible to prevent the destruction of trolley wheels by almost continual arcing when attempting to take from the wire the heavy current required in starting and during acceleration, as well as the smaller currents taken at the maximum speed. There has been a good deal of trouble, moreover, in keeping the trolley on the wire in making speed and taking curves, and many trolley poles have been broken. The trolley difficulties have not interfered with the continuous operation of our line, but the cost of replacing wheels and poles has been rather large.

These difficulties have had an important influence in causing us to reach a decision in favor of the third rail. The contact shoes which take the current from the rail to the motor circuit have given, on the whole, good satisfaction, although they are occasionally carried away by the approach blocks at grade crossings when these blocks happen to

be slightly misplaced so that the shoes strike them at the wrong angle. The contact shoes are suspended by cast iron links, which are intended to be weak enough to allow the shoe to break away easily without doing damage to the framework of the car. The trail cars are also equipped with shoes and connected with the circuits on the motor car by means of flexible couplings, and it is possible, therefore, when the cars are run in train, to bridge the longest gaps found at grade crossings and switches, so that it is not necessary to turn the current off on approaching these. This arrangement makes our trail cars independent of the motor car for heating and lighting.

It will be noted perhaps that the Nantasket motor cars have two trolley poles, as well as contact shoes, and the changing from trolley to third rail simply means the pulling down of the pole and the closing of the third rail switch.

THIRD RAIL AND RETURN CIRCUIT.

Our third rail and return circuit experience will perhaps be of value to both street railway and steam railroad managers, as we have undoubtedly made a wide departure from established methods. We have solved a number of interesting problems.

First is the question of insulation. The third rail has a potential of 600 volts above the ground and rests upon creosoted wooden blocks dowelled into the ties, its eaves being only 1⅝ inches above the tie. Now it frequently happens that water accumulates two inches or more in depth over the ties, and, if it were not for our experience to the contrary, we would naturally suppose that, under these circumstances, the line would be directly short circuited between the third and service rails through the water, the distance being but about two feet each way. Nevertheless, we have been able to operate our road without the slightest difficulty when this has happened, and nothing unusual has been noticed at the station, nor has the electrical output, as registered by the recording watt-meter, been abnormal. At Berlin we have watched the ammeter closely when we knew the tracks to be submerged in two places ten miles apart, during a heavy rain storm, and have found that the leakage was almost imperceptible when both cars on the line were at rest and their air pumps out of circuit. At the same time, the watt-meter was standing still. Of course, if a long length of track was submerged, the leakage might become serious, but we have yet to learn how much is necessary to accomplish this result.

We aim to so connect our third rail lines and the service rail return as to have a practically complete metallic circuit of extremely low resistance; as far as possible, disconnected with the ground. We do not believe in grounding our track, and, though ground plates are placed at the station, connected to our generator, by far the largest proportion of the return current comes through the cables connected directly with the track, the percentage coming from the ground plates being extremely small.

The joints of the third rail are bonded by long copper plates, firmly bolted to both sides of the joint, sixteen bolts being used in all. These copper plates are tinned before being put into position. Owing to the large area of contact surface, the presence of rust on this surface does not materially interfere with the conductivity of the joint, as shown by accurate tests.

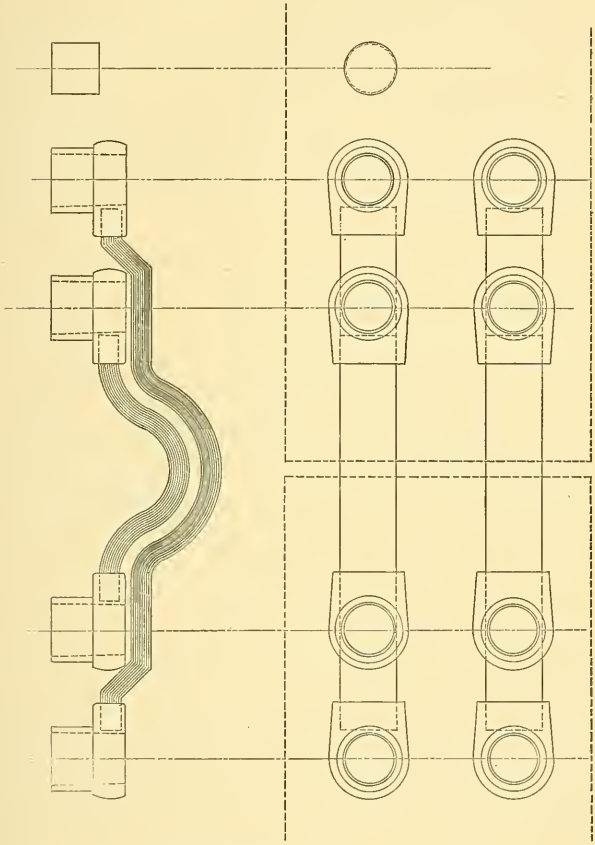


FIG. 5.

The service rails are bonded with the greatest care, four copper leaf bonds, having a cross section of copper equal in conductivity to that of the rail, being used. These bonds are inserted in the base of the rail instead of the web, so as to prevent breakage through play at the joints. The copper leaves are cast into end piece blocks in such a way as to weld them thoroughly together in the blocks. The latter are

formed into a hollow cylinder, one inch in diameter, which passes through a hole in the flange, and by which a large area of contact is secured. Tapered pins are driven into the inside of this cylinder from the top of the flange, and the connection made is very perfect. The form of this service rail bond is shown in Fig. 5. Careful tests have shown that the joints of both third and service rails have now a slightly greater conductivity than an equal length of the rails themselves. Some of the tests of our third rail and service rail bonding and of the experiments which have led up to our present practice may be of interest, and are shown in Figs. 6 and 7.

A few words about the danger of the third rail system would, perhaps, be in order. There have been many cases of people who have stepped from the ground to the third rail without feeling the current, and anyone can step upon it from a dry tie without the slightest effect. On all except wet days, our employes work about it without trouble,

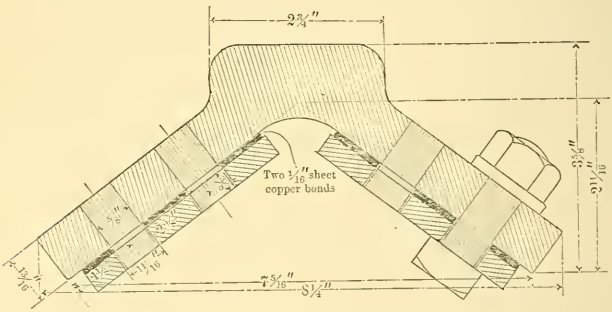


FIG. 6.

avoiding, of course, putting themselves in direct contact with both service and third rails, but not infreqently "monkeying" with the current in such a way as to get shocks of more or less severity in a sort of horse play. On wet days, they refer to the third rail as being "lively," and are inclined to let it alone. Many of our employes have, however, received the heaviest shock possible to obtain, time after time, and care little about it, though those who are more influenced by electric shocks than others are sometimes thrown off their feet, but recover fully in a few minutes. We do not say that the third rail has no dangers, but we do not consider the danger as being at all serious, or one which should interfere with the extension of the system.

As a result of exceptional care which we have taken in bonding our third and service rails, we have found it unnecessary, in any third rail work so far done, to use copper feeders, in spite of the fact that we are obliged to transmit current from Berlin to Hartford, a distance, as

before stated, of 12.3 miles, straight away from the power station. This work is made up as follows: from Berlin to New Britain, a distance of 3 miles, there is a complete double track electric road with two 100 pound third rails and four 74 pound service rails, all most carefully bonded as described above. From New Britain to Hartford, a distance of 9.3 miles, there is one complete electric track, with 100 pound third rail and 70 pound service rails, all carefully bonded, in addition to which we have connected to the service rails of the electric track the rails of the second track, paralleling this the entire distance, at various places, in order to get the benefit of whatever conducting power there might be in this track connected only by its fish-plates at the joints. As a result of this work, we are able to run two trains of 52 tons each on the New Britain and Hartford line with an average loss of but 26½

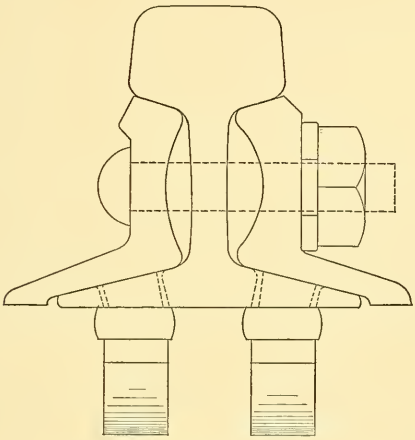


FIG. 7.

per cent. The current output of the station at such a time averages about 300 amperes, with a maximum flow of about 700 amperes at a pressure of 600 volts. Of course, if the service were heavier, so that more cars would be required, it would, undoubtedly, be necessary to reinforce the third rail with feeders.

COST OF POWER.

In our Nantasket Beach station, we have installed two engine generator units of 800 h. p. and 550 k. w. capacity each. The steam is supplied by eight boilers of 200 h. p. rated capacity each. On heavy days, both these engines are required, but on ordinary days but one only, and this is not fully loaded; the average loads being perhaps one-half the maximum.

In the Berlin station we have installed two engine generators of 1200 h. p. and 850 k. w. each. The steam is supplied by ten horizontal tubular boilers of 200 h. p. each. One unit only is required in the practical operation of all the cars on the Berlin and Hartford lines, and the average power output is hardly one-fourth of the maximum capacity.

In both stations, our aim has been not to follow out any engineering fads, but to provide apparatus proved by long experience to be of the most simple and durable character.

The details of piping and arrangement of steam apparatus have been so thoroughly described in the technical papers that it is unnecessary to refer to them here.

We are now running our Nantasket plant condensing and our Berlin plant non-condensing, the loads in the latter being too light to make condensing profitable.

In spite of the fact that these general conditions of operation do not point to a low cost of power, because of the fact that we are working neither station at anywhere near its full capacity, I suppose we are, as a matter of fact, producing power more cheaply than can be done in any power station in the country using coal as a fuel, the reason being that we are burning sparks. "Sparks," as we are accustomed to call them, are the half consumed coal dumped from the extension front of locomotives at the Company's various round-houses. Nevertheless, there is a great deal of steam generating value in these sparks, as we have found by experience, and they are being carried on the Company's cars to our stations at Berlin, Nantasket and Stamford, and charged to the electrical operation at the cost of freighting (including the usual profit to the Company for transportation), plus the cost of loading and unloading, a total charge of seventy cents per ton delivered.

In order to burn these sparks, we are obliged, of course, to make some changes in the furnace arrangements, chief among which is provision for the introduction of live steam under the grates, forming a blower or forced draft as well as providing the water which, in decomposition, furnishes the oxygen and hydrogen gases which increase greatly and facilitate in combustion of half burned coal and add enormously to the furnace heat. We originally supposed that some form of shaking or self-cleaning grate would be necessary in burning sparks, but have found in practice that, with ordinary grates, together with the steam blower, there is no difficulty. In our experimental days, it was thought that it might be necessary to use a proportion of ordinary soft coal with the sparks, and did so for a while, but it was not long before our firemen were educated to burn sparks only with entire ease, and no other kind of fuel is now used by us. Of course, we have to use a greater weight of this half-consumed coal than would be the case with new coal, but still the economy is great, as a good quality of run-of-mine coal costs us, in Connecticut, about three dollars per ton delivered at the power station.

A few figures as to the cost of power at Stamford may be of interest. This station furnishes current for our street railway system at Stamford and for lighting our railroad stations with 350 incandescent lamps. We are operating one engine only, of 500 h. p. total capacity, direct connected to one 300 k. w. generator. In the boiler room are six 200 h. p. boilers. For the first six months of full operation with sparks only, the total cost of fuel for this station amounted to three mills per h. p. hour or four mills per k. w. hour. For so small a station, and one where the average amount of power developed is hardly more than one-third the rated capacity of the engine, I believe this to be a low figure. We have recently made, for our own information, for use in larger plants, special tests of the cost of power developed in this way, using for this purpose a water rheostat, in order to load the engine up to more nearly its full capacity. As a result of these tests, we find the cost of fuel for power, with the use of coal, to be 3.2 mills per h. p. hour or 4.2 mills per k. w. hour. With the use of sparks, the cost is reduced to 1.9 mills per h. p. hour or 2.5 mills per k. w. hour.

At our Nantasket power station this season, the cost of fuel, with the use of coal, has averaged 4.2 mills per h. p. hour or 5.6 mills per k. w. hour, while, with the use of sparks, the cost has been 2.1 mills per h. p. hour or 2.8 per k. w. hour.

As before stated, our Berlin plant has not been run as economically thus far as it will be when a greater load is put on the engines and it will seem to be in the interest of economy to run compound condensing. At this station, the cost of fuel, with the use of coal, has been nine mills per h. p. hour or twelve mills per k. w. hour. Using sparks as fuel has reduced this cost to three mills per h. p. hour or four mills per k. w. hour.

It is very difficult, of course, if not impossible, to make any direct comparisons between the cost of motive power for electric railroading and that for steam railroading, on account of the different way in which the trains are made up. The best criterion would be the cost of motive power per ton mile hauled, but even here the results would be of little value on account of the wide difference in conditions, and, as a matter of fact, we have never attempted to make such comparisons.

I have tried to give you, as briefly as possible, some of the results of the pioneer work which the New Haven Company has been doing in heavy electric railroading. They are roughly stated, and we cannot pretend that they are in any way conclusive as affecting general railroad practice. For ourselves, however, we have formed some definite ideas as to what is possible for us to accomplish, and our plans for the future are being made with great care by President Clark and the Board of Directors, with the intention of dealing with the new transportation conditions which confront us in a broad-minded and progressive way. It is felt that a great transportation agency of this character owes it to the public from which it has obtained its franchises, to furnish the best possible

service and to make the most of the natural advantages which it possesses.

There will always be room, doubtless, for railroads of two characters, the one operating on a purchased right of way, where trespassers can be kept away and high speed obtained, and the other operating on streets and highways, where passengers can be taken up and let off at their own doors. It is possible that, in some thickly settled districts, such as are found in New England and the Middle States, where population groups almost touch each other, these two classes of service may occasionally be performed by the same agency, but there is no reason ordinarily, why there should not be the most amicable and friendly relations, and not infrequently of a business character, existing between steam railroad and street railway companies.

Respectfully submitted,

N. H. HEFT.

DISCUSSION ON REPORT OF THE COMMITTEE ON "APPLICATION OF ELECTRICITY TO RAILROADS NOW OPERATED BY STEAM POWER."

THE PRESIDENT—Gentlemen, you have heard the paper presented by Mr. Heft. What will you do with it?

MR. BEAN—I move that the paper just read be received and placed on the record, and a vote of thanks extended to Mr. Heft for the paper. Carried.

THE PRESIDENT—Mr. Heft has a great deal of information, undoubtedly, which is not contained in the paper, and he will be glad to answer any questions that you may ask him.

MR. PALMER, Fall River—I ask Mr. Heft what the cost he has given us represents—the total cost of power, or cost of fuel only?

MR. HEFT—I stated plainly it was the cost of fuel only.

MR. PALMER—Can you give us any figures which will show us the total cost of power per kilowatt hour or car mile?

MR. HEFT—That cost would depend entirely on the conditions of your station. No two stations would have the same conditions. At Stamford you can notice that our power costs us a great deal less, because we are running nearer to the normal capacity of our engines. At Nantasket the economy is not so great; and at Berlin, where we are only running the high-pressure side of the engine, it costs a great

deal more. This is true also of the labor. The labor where the large engines are costs more than it does with the small engines, as we are running away below our normal load. If we were running our Berlin station up to its normal capacity, we would show a greater economy in fuel and labor than in the other power stations, because there is a certain fixed charge which we are subjected to at all stations, and the amount of that depends on the size of the station and the number of units.

MR. PALMER—I appreciate that what you say must necessarily obtain, but what I wanted to find out was, whether you had at hand or could give the cost for any one particular station ?

MR. HEFT—We have that information in our office. I did not put it in this paper.

MR. PALMER—It seems to me that it would be very interesting for some of us who are operating street railway power stations to be able to compare our cost of production of power with the cost of production of power in those plants which have so recently been fitted up with everything of the latest type, and I should like to be able to compare some of the figures which we have made with some of those which the New York, New Haven and Hartford has been making in its stations. For instance, the total cost per kilowatt hour delivered at the switchboard, including all expenses which should properly come in — taxes, insurance, interest, labor, supplies and everything else chargeable to it.

MR. HEFT—I will say through you, Mr. President, to the members of the Association, that we will very gladly furnish any of this data that you ask for upon application at our office. We will supply any of our plans, maps or data sheets. We have nothing that there is any mystery or secrecy about, and we will be glad to place it at the disposal of any member of the Association. [Applause.]

THE PRESIDENT—I take it that your reply means that you have not these figures in your memory ?

MR. HEFT—No, sir, I could not possibly carry the data in my mind.

Mr. Newman, New Orleans—What is the cost of the sparks?

Mr. Heft—I stated that to be seventy cents for a ton of 2,000 pounds. These figures are based against coal costing three dollars a ton. While the sparks do not cost our Company anything (it is really an expense to get rid of them, as every steam railroad man knows), we pay our motive power department of the road the cost of handling and loading, and the freight department the freight between the points loaded and our power station.

Mr. Durbin, Denver—Can you give me some idea of the relative cost of construction of the third-rail system, as compared with the overhead and feeder system, in this case.

Mr. Heft—I think, if I recollect the figures, that the third-rail construction costs us—for the third rail, bonding of the rail, and cables at the grade crossings, and bonding of the surface rails—about three thousand dollars per mile. Figured against our cost at Nantasket, it is about one-half, but I will also furnish those figures to any one. We have them made up in our office. I did not think of bringing these items with me.

The President—We will proceed to the next order of business, which is the paper on "The Best Method of Settling Damage Cases, and the Prevention of Accidents by the Use of Fenders or Otherwise," by Mr. Willard J. Hield, General Manager, Twin City Rapid Transit Co., Minneapolis, Minn.

Report of the Committee on "The Best Method of Settling Damage Cases, and the Prevention of Accidents by the Use of Fenders or Otherwise."

Mr. Hield read the report, as follows:

Mr. President and Gentlemen:—It is hard to handle, in a short paper, this most difficult subject which is to-day perplexing the officials of all large street railway systems. However, as the study of these questions is made imperative by reason of their serious importance, I venture to offer a few ideas which I trust may prove of some interest, if not of value.

Like all other professions, the law has in late years given rise to many specialists, among whom the personal injury lawyer is most promi-

nent to the street railway manager. His untiring efforts have wrought such a change that the question of settling damage cases to-day is vastly different from what it was a few years ago. The general manager or superintendent can no longer personally adjust the claims against his road, but must employ men for that particular purpose. It is now necessary for him to have a Claim Department; the system of which should be perfect in detail, and work in true harmony with his Operating Department, both for the prevention of accidents and the settling or fighting of damage cases.

The secret of success in handling damage cases lies, no doubt, in their being properly looked after from the start: i. e., from the time they are first reported. How to do this varies as do the different cases, but no case should ever be handled by any one but an honest, careful and experienced claim agent. For such work men must be naturally qualified; they should ever have the interests of their road at heart and yet not be blinded by too great a prejudice in its favor; they should have sound, shrewd judgment, and be pains-taking and careful of detail to the highest degree. Like the true physician, they should be of a happy, calm temperament, and also, like him, should ever be ready to answer a call. The successful claim agent should have the faculty of handling all sorts of people without friction. His keen perception should reveal to him the nature of each case, but he should never betray anxiety for settlement.

Every claim department should have a good system for securing reports of accidents, for obtaining evidence, and for keeping such files and records as may be necessary for its work.

The only accidents which demand serious consideration are those in which personal injury is involved. These may be divided into the three following classes:

First—Those in which there is an undisputed liability and which, as a rule, should be settled as soon after the occurrence as possible.

Second—Those in which there is a doubtful liability and which, generally, should be settled after careful investigation.

Third—Those in which there is clearly no liability and which should, therefore, never be settled.

Frequently cases may prove exceptions to these rules, but in handling them under such a classification or any other, the following suggestions would seem to be of importance:

First—It is of great value in every case to acquire a knowledge of it as early in its history as possible. Procrastination is ever dangerous and the claim agent should have for his motto: "Time is the essence of success."

Second—Evidence should be carefully secured in every case soon after the accident. Too much can never be reported to the department, and what may seem of little importance at the time of the accident, may prove most valuable in preparing the case for trial.

Third—In nearly all unsettled cases (particularly in serious ones), an examination by one or more surgeons in behalf of the company is desirable.

Fourth—Assistance and kindly tender of services, immediately after a serious accident, are more in place than advances for settlement.

Fifth—Admission of the company's negligence is seldom necessary, but the true rights of the claimant should not be denied; as by antagonizing him all chances of settlement may be lost.

Sixth—Whenever possible a sworn statement should be secured from the claimant, giving his history of the accident and stating as nearly as possible the damage done. Such an affidavit, carefully and truthfully drawn and signed before witnesses—who should also attest it—may often prove most valuable either in settling or fighting a case. By it the claims of the interested party are clearly defined and limited, so that any subsequent intention to change them may be checked.

Seventh—In every case the claim agent should be fair but firm. Too cheap a settlement is not the best settlement, but one too expensive is quite as bad and perhaps worse. However, the claim agent can generally keep the claimant good natured and insist upon his acknowledging that the settlement is a fair one at the time it is made, and thus prevent his feeling or talking ugly about it later.

Eighth—A full release of all claims should be taken from the claimant, and its contents explained to him fully. This is of great importance, as the validity of releases is often disputed, and it is then quite necessary to show that they were properly taken. On this account it is best to explain the release to the claimant before witnesses (who should also attest it), or to make him acknowledge later before them that he executed it of his own free will understanding its nature.

From these suggestions one may deduce that the method best adapted for the handling and settling of damage cases is to be prompt, thorough and careful, with a liberal use of sound, common sense. Whether a case should be speedily settled, or not settled at all, is a matter which must be decided from the peculiar circumstances which it presents and not by any fixed rule. As a general thing, however, it is well to settle all cases where the injured parties are inclined to be fair, according to the merit each case contains, and fight all cases in which the claimants are very unreasonable or where fraud is apparent. This rule carried out with the right spirit will prove a valuable policy for any road. If a case is settled, let it be done with due consideration of justice, and if it be fought, let every effort be made to fight it in the fairest and most efficient way possible.

It is not usually desirable that the claim agent should make offers of settlement, but rather it is advisable for him to draw his man out and get him to state definitely, if possible, what sum he really thinks he should be paid. Generally, such a sum can be considerably cut down, no matter what the case, but if it is not an unfair amount, in considera-

tion of the injury, it should be paid. Seldom pay more to a lawyer than to the injured party himself, and do not settle a case simply because suit is threatened or commenced. Never settle out from under an attorney who has been professional and courteous in his relations to the road, yet when an unprincipled damage lawyer is interested in a case, do not hesitate to disregard him in settling it. When a good one to fight, the case should not be settled simply because it will cost less. It is ever well to remember that victories in court are a great benefit and defeats are a great loss.

While as a strict matter of law it may not be correct, yet it is always well to give some consideration, when settling a case, to the circumstances of the injured party and allowing such personal interest to enter into the transaction as will not be inconsistent with good business principles. As a general thing, the claim agent should listen with apparent indifference to the claims of such persons as Jewish peddlers, loud-talking and bull-dozing men, sharp tongued women, and all others whose claims have either the appearance of fraud or unreasonableness; with apparent interest to those who seem but fair and businesslike; and with both apparent interest and sympathy to those other few cases which seem to merit it.

The gist of the foregoing may be expressed in these few words: Have good claim agents of sound judgment, who will not settle cases by arbitrary rules, but who will rather consider them each in its peculiar details, weighing well the seriousness of the injury, the manner of the accident and hence the liability involved, as well as the circumstances of the claimant.

The old saying that "an ounce of prevention is worth a pound of cure" was never better applied than to the accident features of a modern street railway system. The rapid transit now in vogue upon the busy thoroughfares of our cities, whether by means of the trolley or the cable, has greatly increased the number of street railway accidents and hence has caused the question "How to avoid them?" to be of very serious interest.

For this purpose the following points seem to be of particular interest:

First—It is very important, for the prevention of accidents as before stated, that the operating and claim departments work in perfect harmony and unison with each other to this end.

Second—The employing of none but good men is most essential, and having employed good men, it is quite important to keep them good in the fullest sense of the term.

Third—Carefully drawn, explicit rules for operating cars made with due regard to the various local conditions, should be rigidly enforced and intelligently observed.

Fourth—Speed on various lines should be regulated according to the chances of accident presented.

Fifth—Every car should be equipped with the best controlling apparatus, gong and head-light, and also be provided with such devices for the prevention of accidents as may seem practical.

By this last statement several good devices for the prevention of accidents are rather indefinitely referred to, among which the fender and the safety gate should be placed at the head. Experience has shown that the fender is seldom a nuisance and is frequently of great value. A simple type will be found to be very practical which, while it does not insure against injury, yet very often prevents serious results. The dropping or lowering of the fender is seldom of any benefit, as motormen are generally too much occupied in stopping their cars when a collision is imminent to pay attention to the fender. In many cases where the speed of cars has been reduced from a fast to a slow rate the fender will pick up persons with no harm resulting, who without it would surely go under the car. Where the collision occurs while the car is under great speed, serious injury is not unlikely, but even in these cases loss of life and limb may frequently be prevented and money saved in the long run.

The safety gate, with which all motor cars in Minneapolis and St. Paul are equipped, and which was not generally approved upon its introduction but a few seasons ago, has demonstrated its great value and practicability by almost annihilating those accidents which occur through boarding or alighting from cars. The danger of these accidents increases with the number of passengers carried, and with nearly every road they cause a large part of the injury and damage expense. They present to the "faker" the best opportunity for making a case, and always give the jury a good chance to give the plaintiff the benefit of a doubt. The safety gate is practical for any city. In fact, we have seen its best use when our road was earning over three times its ordinary receipts. With it the conductor has but one part of his car to watch while giving the starting-bell, and in case there is reason for passing persons at crossings, there is no danger from their trying to board the moving car. It also affords protection to people standing on the rear platform in case of a car rounding a curve at high speed, or on other occasions, when a passenger, through his own condition or carelessness, or the operation of the car, is liable to fall off.

The gate being operated by the motorman, should never be opened until the car is at a standstill, and should always be closed just before the power is applied for starting. After the public become accustomed to the safety gate, its operation demands no change of running time from that used before its introduction. The most timid, whether old or young, will walk without fear to the gate while the car is stopping and thus take but little time to alight. The gate is also of great service in handling large crowds at the parks where people seem to lose their common sense, as well as all ideas of propriety, and try to board and hang on to cars regardless of the danger involved. In such instances the value of but one entrance to the car is quite obvious, as at any moment the

crowd may be checked by the closing of the gate and the car started. The value of both the fender and safety gate can best be understood by closely watching their use. Both are eminently useful and practical. They each have also a good moral and instructive influence; they caution both the public and the trainmen against accident, and also cause the community to realize that a soulless corporation has some regard for life and property and sincerely desires to avert accident to them. They also give to the trainmen an assurance in operating the cars which is of itself of considerable benefit.

Screens for the side of cars (when the trolley posts are between the tracks), sand boxes always filled with sand, and many other devices, are also of considerable importance and tend each in their way to reduce the number of accidents to the minimum.

It is not possible, however, to operate cars entirely without accidents and in studying the problem we should not look for perfect results.

The above presents roughly a few ideas suggested by long experience after trying nearly all the remedies known, and gives one the firm opinion that it is essential, so far as possible, to have the best equipment, including practical safety devices and the best men obtainable for operating the cars and for the claim and other departments, governed and aided by the best rules and supported by the best policy.

Respectfully submitted,

WILLARD J. HIELD.

The President—What action will you take upon the paper just read by Mr. Hield?

Mr. Rigg, Reading—I move that the paper be received, spread upon the minutes, and a vote of thanks be extended to Mr. Hield. Carried.

The President—Are there any questions you would like to ask Mr. Hield, or is there any discussion on the subject?

If there is no discussion on this paper, is there anything of a general nature that any one has to bring up before we proceed to the next order of business, which will be the report of the Committee to recommend officers for next year and select the place of meeting.

Discussion on the question of having reports of committees printed in advance of the meeting.

Mr. Davis, Williamsport—Would it be practicable in the future to have the papers read at the meeting printed for distribution about fifteen days before the meeting of the

Association? It would be of considerable assistance to the members in preparing for the discussion of the papers.

THE PRESIDENT—That was formerly done, but the man who is going to read a paper does not want you to know what it contains before he reads it.

MR. DAVIS—I will simply say in regard to that, that it is done in a number of other Associations; in fact, it is the practice with a large proportion of organizations of this kind. It gives the members an opportunity to study the question a little more.

THE PRESIDENT—Do you desire to make a motion that we do that in the future?

MR. DAVIS—I move that the Secretary be instructed to have printed, as far as practicable, such papers as are prepared sufficiently in advance for the members to get them at least fifteen days before the meeting of the Association.

THE PRESIDENT—As far as practicable—

MR. DAVIS—Yes; because sometimes the Secretary does not get the papers—

THE PRESIDENT—And circulate them among the members of the Association.

THE SECRETARY—Mr. President, I will say that one gentleman who was to write a paper for this meeting wrote me and asked me if his paper would be published before the time of the meeting of the Association. He said that if it was to be so published he would not read it. I replied that it would not be published until he read it.

MR. DAVIS—To meet that, I suggest that no paper be published in advance against the protest of the writer. This practice is followed in the National Electric Light Association, and is very satisfactory. If a gentleman insists on its not being printed we ought to recognize his request. I will add to my motion the words "subject to the wishes of the author of the paper."

MR. BEAN—If I am not mistaken Mr. Davis is a member of the National Electric Light Association as well as myself. The papers are printed in advance. I do not remember that the papers to be read at the meetings of the

American Street Railway Association have been printed in advance for a long time. It was tried about four or five years ago, and did not seem to be a success. I shall oppose this motion. I could have read Col. Heft's paper with a good deal of pleasure at home, and when it was being read here could have remained at the hotel. I took it upon myself as a duty to come here. I do not think it is in the interests of the American Street Railway Association, whether the writer consents or not, to publish the papers in advance. There are probably a thousand street-railway companies in the United States, and the Secretary reports that we have a membership of about one hundred and seventy companies. We want to increase our membership. I have not had much to say on this subject in the National Electric Light Association, because this practice was in vogue when I became a member; but in this Association—I refer to it with pride—I have been at sixteen meetings, and will oppose the motion, and trust the other gentlemen will assist me in voting it down. We can get along in the old-fashioned way as the President intimated, and have our papers read at the meetings.

The President put the motion, which was defeated by a large vote in the negative.

Mr. Woodruff, Atlanta—I have a friend here from the Cracker State, who has recently put in operation quite a novelty in the shape of a car, and it may be of interest to some of the gentlemen to see photographs of it. It is a Georgia pine car, built at his own shops, with motor frame and truck combined. He is running it very successfully; and I think it would be of interest to the members of the Convention to see the photographs, and have Mr. Zimmerman, who is superintendent of the Atlanta Railway Company, explain the principal features of the car.

The President—Do you wish to hear the description of this car? [Voices: No, no.]

Mr. Woodruff—He is a member of the Association.

The President—We will pass on this question just as we did with the storage-battery men yesterday. Gentlemen, do

you wish to give Mr. Zimmerman an opportunity of placing his new device for a car before you ?

THE PRESIDENT put the question to vote; and it was lost.

THE PRESIDENT—We will give Mr. Zimmerman the same opportunity that we did the storage-battery men yesterday. If he will say where he can be found you will all go to see the photographs of the car.

MR. ZIMMERMAN, Atlanta—Gentlemen, I am not here to promote any scheme of that sort. I designed this car at my leisure, more out of curiosity to see what I could do than anything else. I am an operator and not a promoter, at all. Mr. Woodruff, who is from the same town, has urged me to put this before the Convention. I had never thought of doing this as a matter of advertising the car.

THE PRESIDENT—Will you state where your headquarters are, so that you can be found ? There may be some gentlemen present who are interested in the matter and will call upon you.

MR. ZIMMERMAN—I am at the Cataract House.

MR. HEFT—Mr. President, I have arranged with Mr. W. J. Clark, of the General Electric Company, to have placed in their parlor a portfolio that I have brought with me from my office, containing a lot of maps, curves and data sheets; and I would be glad to have any of the members of the Association examine them, if they desire. They are at perfect liberty to do so.

REMARKS OF THE PRESIDENT AS TO SUBJECTS FOR COMMITTEE REPORTS FOR THE NEXT MEETING.

THE PRESIDENT—The Secretary has something to say, and right here, before I forget it, I would like to announce, while we have so many in the room, that the Executive Committee, during the past year, considered and went over every subject that was submitted to them on which papers might be prepared; and they were guided by these suggestions in their selection of the subjects and persons who read papers at this meeting. I would like all the members to repeat that, and send to the Secretary at any time during the

next thirty days—because the Executive Committee may meet soon—suggestions of subjects on which papers may be prepared for next year, and the incoming Executive Committee, I assure you, will consider them all. We should also like you to suggest persons to prepare these papers. Please suggest those who will prepare the papers and do it in earnest, like those who have done it this year. We have had excellent papers. Try to suggest those who will come to the meeting and read the papers.

THE SECRETARY—I simply desire to say that Mr. Greenwood, the manager of the International Hotel, says that the doors will be opened promptly at half-past seven, this evening, for the banquet. We would like everybody to be ready at that time. Those who have not procured tickets can get them at the entrance to this hall.

THE PRESIDENT—Is the Chairman of the Committee which was appointed yesterday to nominate officers for the ensuing year, and recommend a place for the next meeting, ready to present the report? If so, we will be glad to hear it.

REPORT OF THE NOMINATING COMMITTEE.

MR. WATSON, Buffalo — Mr. President, the Committee appointed to nominate officers and report a place for the next meeting, presents the following report:

NIAGARA FALLS, October 21, 1897.

THE AMERICAN STREET RAILWAY ASSOCIATION,

Gentlemen:—The Committee on Nominations of Officers for the ensuing year, report in favor of the following persons:

For President,
ALBION E. LANG, Toledo, Ohio.

For First Vice-President,
W. CARYL ELY, Niagara Falls, N. Y.

For Second Vice-President,
JOHN A. RIGG, Reading, Pa.

For Third Vice-President,
EDWARD G. CONNETTE, Nashville, Tenn.

For Secretary and Treasurer,
THOMAS C. PENINGTON, Chicago, Ill.

EXECUTIVE COMMITTEE.

ROBERT MCCULLOCH, St. Louis, Mo.
C. DENSMORE WYMAN, New Orleans, La.
HENRY C. MOORE, Trenton, N. J.
JOHN M. ROACH, Chicago, Ill.
ROBERT S. GOFF, Fall River, Mass.

For place of meeting, the Committee recommends BOSTON, MASS.

Respectfully submitted,

H. M. WATSON,
A. T. POTTER,
JOHN A. RIGG,
E. S. GOODRICH,
W. WORTH BEAN,
E. WOODRUFF,
G. B. KERPER,
Committee.

MR. SHAW, Boston—I move that the report of the Committee be accepted. Carried.

MR. BEAN—I move that the Secretary be authorized to cast the ballot of the Association unanimously for the gentlemen named. Carried.

THE SECRETARY duly cast the ballot.

THE PRESIDENT declared the gentlemen duly elected for the ensuing year; and read the programme of entertainment provided for the afternoon and evening by the local committee.

On motion, the meeting adjourned until Friday morning.

FRIDAY'S SESSION.

PRESIDENT MCCULLOCH called the meeting to order at 10:45 a. m.

THE PRESIDENT—We will now take up any unfinished business that may not have been disposed of, or any new business that any gentleman has to offer.

VOTE OF THANKS TO THE RETIRING OFFICERS.

Mr. Kerper, Dayton—I move that a vote of thanks be tendered to the President, Vice-Presidents, and the Executive Committee for the able manner in which they have conducted the affairs of the Association during the past year. Carried.

RESOLUTION OF THANKS TO PASSENGER ASSOCIATIONS.

Mr. Rigg, Reading—Mr. President, I desire to offer the following resolution:

Resolved, That the members of the American Street Railway Association, in annual meeting assembled, express their thanks to the several Passenger Associations of the United States for their courtesy in granting reduced rates to the members of this Association and their friends, who are in attendance upon our annual meeting.

Carried.

APPOINTMENT OF COMMITTEE ON TRANSPORTATION.

The President—In connection with the resolution just adopted, I desire to say that I think the Passenger Associations have been courteous, but not courteous enough. They receive a large amount of money from the delegates to our meetings, and they do not give us any greater concessions than they give to any association which can raise one hundred attendants at its meetings. I said to the railroad people at St. Louis that they were not granting us any more of a concession than they would give to any organization that could guarantee one hundred tickets. I think we should hereafter receive a round-trip ticket for a single fare. I have, therefore, considered it wise to appoint a Committee on Transportation. The Committee will consist of T. C. Pen·ington, chairman; and the other members will be James H. McGraw, of the *Street Railway Journal*, and H. H. Windsor, of the *Street Railway Review*. The orders and instructions of this Committee will be, if it is possible, to go right ahead at work now, and not wait until we are getting ready to go to Boston, but work at it now, and I believe we can get at least a round trip for one fare.

Mr. Dodge, New Haven—Could not this Committee go a step further, and would it not be possible to have it arranged so that our tickets would be good on any train. You can not take the mail and express trains of some roads, neither can you take the fast express trains of the Michigan Central Railroad Company.

Mr. Bendure, Atchison—These rates should reach west of the Missouri river.

The Secretary—I will say that every Passenger Association granted the reduced rates for this meeting except the Western Passenger Association. I had considerable correspondence with the Chairman of the Western Passenger Association. This meeting took out of the territory of that Association Chicago, St. Louis and many other large cities, and it left very little territory in the Western Passenger Association. I understand that some passenger associations have granted this one-fare rate to other associations no larger than ours, and if any of you gentlemen know of such an instance, I wish you would let the Committee know; because a prominent steam railroad man has told me that if we could prove that such had been the case, he would get the same concession for us, as he had enough influence with the Passenger Association to do this.

VOTE OF THANKS TO LOCAL COMMITTEES, AND ALL WHO HAD CONTRIBUTED TO THE SUCCESS OF THE NIAGARA FALLS MEETING.

Mr. Bean—Mr. President, I move that a sincere and hearty vote of thanks be extended to his honor, Mayor Hastings, who so warmly welcomed the Association to this city; to the General Committee, the Committee on Banquet, the Committee on Exhibits, and the Committee on Entertainment, for the complete arrangements which they made for our entertainment and business meetings and the thorough manner in which they were carried out; to the Supplymen for their elaborate and complete exhibit; to the Niagara Falls Hydraulic Power and Manufacturing Company, the Niagara Falls Power Company, the Niagara Falls Paper

Company and the Carborundum Company, for the opportunity of inspecting their interesting plants; to the International Hotel Company, for unceasing attention to our comfort and convenience; to the Buffalo Railway Company, the Niagara Falls and Suspension Bridge Railway Company, the Niagara Falls and Lewiston Railroad Company, the Buffalo and Niagara Falls Railway Company, the Niagara Falls Park and River Railway Company, the Lewiston and Youngstown Frontier Railway Company, the "Maid of the Mist" Company, the Niagara Falls and Clifton Suspension Bridge Company, Miller & Brundage Coach Company, Ltd., and the Niagara Falls Navigation Company, for transportation facilities furnished to the delegates and visitors, and of all the foregoing we desire to express our deep appreciation. Carried.

VOTE OF THANKS TO THE LADIES' RECEPTION COMMITTEE.

Mr. Rigg, Reading—Mr. President, I move a vote of thanks to the Ladies' Reception Committee at Niagara Falls, who have done so much to make the stay of the ladies at the Convention so pleasant. Carried.

DISCUSSION AS TO THE PRINTING OF THE PAPERS READ AT THE MEETINGS OF THE ASSOCIATION.

Mr. Lang, Toledo—Mr. President, I desire to say that in conversation with a few gentlemen last evening, it was suggested that hereafter none of the papers presented at the meeting be ordered printed until they had been submitted to and approved by the Executive Committee. I make that suggestion now for your consideration. It was thought that some things which appear in the papers and the discussions following were not proper subjects for the public prints, and I simply throw this out now as a mere suggestion for consideration at our next meeting. It was suggested by one or two members that some papers had been read at this meeting which ought not to go into the public prints in full. It was not known, of course, how far the matter had been carried at

this meeting; to what extent they had been given out to the newspapers.

Mr. Bendure, Atchison—It seems to me that we are running too wide open in that respect. These papers are for the benefit of the members of the Association. Take the smaller roads of this country. Why need they join this Association? They get all the benefits of the papers, except hearing them read. They get the papers and they are worth as much as anything we have to give our members. I think the papers should be printed and circulated among our members only, and in this way we will be better able to get new members than by the course which we now pursue.

The President—I hardly agree with the idea that these papers should not be printed, because simply hearing them read gives you no chance to digest papers such as we have heard read. I do not agree with any one that there was anything said here that might not go into print. We may say things a little too strong, and we may, as Mr. Littell put it, kick a sleeping dog; but the dog is not sleeping, and if we show that we know how to take care of ourselves and are alive to the situation, our enemies will have a good deal of respect for us, and we will gain fairer treatment than by seeming to submit and hide ourselves. I believe in being outspoken in our position on all such matters. There was a convention of Mayors and Councilmen held at Columbus a short time ago, and they discussed all these questions. They are awake to them, and alive to them, and our taking cognizance of the fact does not add to the public interest that these questions are exciting; and I do not believe in hiding our lights and ourselves under a bushel. I say we need not talk too much, but let every one understand that we comprehend the situation, are alive to it, and that we will take care of ourselves and fight for our rights. As to the inducement it would offer to street railway companies to join us, by not allowing them to see these things, I do not believe we would get in any new members in that way. If a company, however small, is not interested enough in the work of the Association, and the benefits which follow from membership,

to pay the small sum of twenty-five dollars a year, we cannot get them by depriving them of the use of these papers. It is a compliment to a man who spends days and weeks in writing a paper to publish it, and let it go before the public in his name. It is a publicity and benefit that he is entitled to, and if we simply read the papers and not allow them to be printed for public circulation, you would find that they would not be willing to devote the time and labor that is necessary to prepare them.

Mr. Bean—I heartily endorse what has just been said. I was one of the original subscribers for the *Street Railway Journal*, and met Mr. Harris, the original proprietor, the other night. Then there is the *Street Railway Review*, the *Electrical Engineer*, the *Electrical World*, the *Electrical Review*, the *Western Electrician*, and the *Electrical Age*. All these papers have come into our field, and they gladly and willingly, at great expense, publish our proceedings. I consider that they have been one of the greatest influences which has made this Association what it is to-day—one of the greatest Associations on the continent. I would not favor any plan to have our reports kept from the trade papers. This custom obtains with every trade organization in the country—the trade papers connected with the Association always publish the proceedings.

Municipal ownership is in the air, and there it will stay, until we can get it into the minds of the people that they are wrong, and that it will cost them more to operate the street railways under municipal control. I was originally located in Kentucky in the street railway business and had a perpetual charter, the same as a man would have a deed to a piece of property. I moved to another State where the Constitution of the State forbids a franchise of longer duration than thirty years. In the State of New York, I am informed, the charters are for nine hundred and ninety-nine years; practically perpetual.

I am in favor of publishing everything that is said and done in this Association. I have always felt a pride in attending these meetings. I attended them when my Company

did not feel like paying my expenses, and I paid them out of my own pocket. I believe that all papers to be read should be examined and approved by the Executive Committee, or a sub-committee appointed by the Executive Committee. They should be looked over carefully before they are presented to the meeting. As to the papers which have been read at this meeting, they can be submitted to the President and Executive Committee to edit, and let them inform the Secretary as to what they want published. The Secretary has a duty to perform and knows how to do it. He publishes everything before him, unless the Executive Committee orders it not published. I trust that the incoming Executive Committee will take action in this matter and confer with the Secretary.

THE PRESIDENT—I do not think there is time now to revise these papers; they have nearly all been printed.

MR. DAVIS—The first paper read at this meeting related to the question of the municipal control of street railways. I am frank to say that my opinion is simply this—that municipal interference with street railways and their vested interests must be fought with facts, and not charges; and it seemed to me most ill-advised on the part of this Association to take as its main ground against municipalities operating street railways, that the officers of the municipalities are not to be trusted by the people. It seems to me that we are bound to meet this question with information and facts; and, therefore, I suggested, and the Association passed, a resolution that the Secretary be instructed to procure the facts as regards the operation of street railways by municipalities. I am meeting this question as regards electric lighting, and I am preparing information on the subject; and the reason why I suggested the resolution is that it is utterly impossible for one company to get all the necessary information. On the electric light question I shall be put to an expense of five hundred dollars to get the information, which ought really to be paid for by a National or State organization. It seems to me if we desire protection in that way we can probably get it through the agencies of the

Association. As far as the paper read is concerned, I would thoroughly disagree with the idea that we can make any successful fight on this municipal ownership question, based on allegations against the people with whom we deal.

Mr. Rigg—As I understand, when the papers were read, they were received and the Secretary instructed to have them printed.

The Secretary—It has always been the custom—Mr. Richardson, the former Secretary, did it, and I have followed the practice—to give the street railway press advance copies of the papers, they agreeing not to print them until they were passed on by the Association. The papers read at this meeting are almost ready to be issued by the journals. They have them in type and ready to print as soon as the meeting adjourns. I have never had any instructions to the contrary, and have done this for the past two years. I think nobody should see these papers until the Association passes upon them. The street railway journals all want them, as they are afraid that some other fellow will get ahead of them in publishing them. The supposition is that the Convention will pass favorably on the papers. I would like some instruction on this question, and will bring it up at the next meeting of the Executive Committee. I do not want to say to the newspapers that they cannot have these papers, unless I have something to back me up in it. I shall try to get instructions from the incoming Executive Committee as to what shall be done with these papers. My idea is not to let anybody see them until the Association votes on them, and then they are published properly.

Mr. Rigg—I move you, Mr. President, that the Secretary be directed to issue no papers to anyone until they are passed upon by the Association, and give no information regarding the papers.

The President—Does Mr. Rigg mean the Association in its regular annual meeting or the Executive Committee?

Mr. Rigg—The Association.

Mr. Chapman, Chicago—That does not accomplish what we wish. If these papers are read in the Association, and it

is understood by the Press that they are not to be published without the approval of the Association, then they will be taken verbatim, and they will go into the Press anyhow just as they are read. The papers should go before the Executive Committee and be passed upon before they are read at the meeting. If I remember rightly, the Pittsburg or Cleveland meeting passed a resolution instructing the Secretary to have all the papers printed in advance of the meeting. They were furnished for one or two years in succession, the complete papers in printed form, several days before the meeting; it being understood that they should not be published, but were for the information of members, so that proper discussion could be entered into at the time the papers were read. That is a common method with all the engineering societies and is a good plan. Nobody is competent to discuss a paper simply on hearing it read. He must read it and digest it before it comes up at the meeting. It seems to me if we debar the Press from getting these papers until they are passed on by the Association, we must have a Star Chamber or the reporters will take them.

Mr. Watson, Buffalo—The Cleveland Convention adopted that rule. The papers were printed and sent to the members to read so that they could discuss them intelligently.

The Secretary—Article XIV. of the By-Laws reads as follows: "All papers read at the meetings of the Association must relate to matters connected with the objects of the Association, and must be approved by the Executive Committee before being read, unless notice of the same shall have been previously given to the Secretary, as hereinbefore provided." Now, in regard to printing these papers beforehand, it is almost impossible to do it, as they are not always ready. One paper read at this meeting was received in this hall after we were in session. The others could have been printed, as they were received in time. I have written an unlimited number of letters to nearly every gentleman who wrote a paper, hurrying them up. I commenced three months ago. A resolution was passed at the meeting of the Executive Committee that they were to be in my hands by

the first of September, and I began prodding them up, and continued it until they were received. I consider that we had very good luck this year.

MR. BEAN—Then the Executive Committee did not pass on that paper which you did not receive.

THE SECRETARY—They did not. I never saw it until the meeting was in session the first day.

THE PRESIDENT—I believe it will be safer to limit this to the Executive Committee, than to the Association. They can take all the time they need to read and study the papers. If they find any objectionable features, they can have the objectionable matter eliminated or changed by the author. As Mr. Chapman has said, if you deny the Press the privilege of publishing these papers, unless you have strictly executive meetings—and they are objectionable—they will be taken word for word and published; but if the representatives of the Press understand that they are going to have these papers, they will take them as we give them and publish them as we want them published. I think that the Executive Committee is a safer body in this matter than the Association. They have in charge the entire affairs of the Association. They have usually done their work well and faithfully, and I think it is better to trust this matter to a small body of men, and make it their duty, than to leave it for the entire Association.

MR. BEAN—The National Electric Light Association prints all these papers in advance.

MR. RIGG—If the Association is not to instruct the Secretary, then the Executive Committee has all the power it requires, and no further resolution is necessary.

MR. LANG—I understood your motion, Mr. Rigg, to be that it is the sense of the Convention that the Secretary be instructed not to give out the papers for publication until they have been passed upon. He has been following the plan of his predecessor, and he desires a little support in the new position he will take before refusing to give them to the Press in advance of the meeting.

MR. RIGG'S motion was put and carried.

DISCUSSION AS TO INSTALLATION OF OFFICERS PREVIOUS TO BANQUET.

Mr. Kerper, Dayton—I suggest that hereafter the installation of officers take place at the close of the session just before the banquet, as has been done in former years, at Washington and other places. I think the new officers should have been installed last evening; and it would be the proper thing for the incoming and outgoing officers to be recognized in their respective positions at the banquet. I make that as a motion.

Motion seconded by Mr. Bean.

The President—I am nearly out and do not expect to get in any more, and so can speak without personal interest in the matter. I do not know, but there may be some people who like a little notoriety and like to officiate at banquets, and for those who are entitled to that and like it you can accommodate them, but if you install the new President and Officers, what are they going to do? This would change the former order of business. The new President has been installed on the last day, which has generally been Friday.

Mr. Kerper—My idea is to simply install the officers on Thursday.

Mr. Ely, Niagara Falls—I rise to speak on the question with diffidence. I am a little new, and do not want to begin to take too much part in the discussion, but it occurs to me, from my knowledge of parliamentary law and procedure, that you are going to create the condition by the passage of the resolution that Captain McCulloch speaks of. The installation of an officer in any large body is similar to and co-equal with the inauguration of a new President of the United States. It is the installation of a new executive officer that gives him the power of his office, and would you not create an anomalous condition of affairs, not only as suggested by Capt. McCulloch, but would you not be practically depriving your body of its power for good in a great measure by cutting in two the session, and conducting one portion of the meeting with one set of officers and another portion with another set of officers; and would not that be the same

condition of affairs as if the Legislature of the State of Massachusetts commenced the first two months with one Speaker and Secretary in office, and then installed another Speaker and Secretary, and held the latter part of the session with them in office? That would be quite contrary to any methods of well ordered and well established bodies, and would be pervertive of their functions and destroy their power to do business.

THE SECRETARY—I will read part of Article III., of the By-Laws, which covers the point in question: "The Officers of the Association shall assume their duties immediately after the close of the meeting at which they are elected."

MR. KERPER—I will withdraw my motion.

INSTALLATION OF OFFICERS ELECT.

THE PRESIDENT—The next order of business is the installation of officers. Those gentlemen who have been elected officers for the ensuing year will please rise. (There were present Messrs. Lang, Toledo; Ely, Niagara Falls; Rigg, Reading; Penington, Chicago; McCulloch, St. Louis; Moore, Trenton; Roach, Chicago.) Mr. Lang, I am glad to turn over to you, sir, as the President of the American Street Railway Association, the gavel of the Association; and I hope that you will use it with as much pleasure and satisfaction, and as much pride, as I have; and I wish you the same courteous treatment, and the same support in your administration, as I have received.

Gentlemen, I have the pleasure of introducing to you Mr. Albion E. Lang, of Toledo, who will preside over your deliberations and fortunes for the coming year. I bespeak for him all the help that I had from the Executive Committee and the Secretary during the past year. There were no troubles and annoyances that we did not surmount without any stings being left behind; and I can wish Mr. Lang no greater happiness than that his rule may be as pleasant as mine. I think this is a position so much to be envied that

any man may be very proud to be selected as the President of the American Street Railway Association, which can boast of as much ability, talent and manliness among its members as any other organization in the country.

By virtue of the authority which I hold as President of the Association, I declare all the newly-elected officers duly installed. [Applause.]

REMARKS OF PRESIDENT LANG.

PRESIDENT LANG—Gentlemen, I dislike very much to open my administration with an apology for my late arrival at the hall; but you all know what a pleasant evening we spent, and it did not end with the ending of the day, but only with the beginning of the next day.

I wish to assure you of my profound pleasure in being called to this office. I deem it a great honor, from the fact that I was in no sense a candidate for the office. My place in the Association has simply been that of a quiet and earnest listener, endeavoring to learn all I can for the benefit of the property I represent. We have had opened up to us in the papers presented at this meeting a number of interesting questions that will command our earnest attention, and some of the improvements suggested we will want to introduce in our systems in the course of the coming year. Other questions will arise which will require our attention at our next meeting. I do not think it is proper at this time to enter upon the discussion of any questions of a practical nature. If I am as successful as my predecessor, and as successful as his predecessors have been, in keeping up the interest in this organization, I shall be very thankful. It does not lie entirely with the officers of the Association to make a success of the Association; it depends upon its members, and as we send out communications during the year, asking for suggestions for topics to be considered at the next meeting, and the assignment of persons to prepare the papers, I hope you will give the matter your prompt attention.

I am sure that Mr. Penington, our Secretary, will do all

he can to aid me in the duties I have to perform. I do not know that I have anything further to say at this time. I am here now subject to your orders. [Applause.]

REMARKS OF FIRST VICE-PRESIDENT ELY.

First Vice-President Ely—Mr. President and gentlemen, all that I can say this morning is that I have enjoyed this occasion very much indeed, and so have our people here; the people of the city express themselves on all hands as having been very much pleased with this Convention assembled in our city. I have heard many flattering remarks concerning the personnel of the Association.

I personally say to you, gentlemen, that I thank you for the honor conferred upon me, and I will try to hold up the President's right hand, while brother Rigg holds up his left. [Applause.]

REMARKS OF EX-PRESIDENT McCULLOCH.

Ex-President McCulloch—A gentleman in business here in the city told me that there had been some steam railroad people here with whom he is acquainted, and they expressed themselves as being surprised at the magnitude of our Convention, the manner in which it was conducted and the intense interest that was taken in its affairs. It has awakened them up; they did not know that we had such an institution. I think these things do us no harm—to have such people realize who and what we are.

Mr. Lang made a remark in connection with his address a few moments since. He said that he considered the honor of his election the greater, because he was in no sense a candidate for the position. I hope the Association will never elect any man President who is a candidate; the honor ought to come unsolicited. [Applause.]

ADJOURNMENT.

On motion, the Convention then adjourned to convene in the city of Boston, Mass., at such time between September 15 and December 15, 1898, as the Executive Committee may determine.

EXHIBITORS.

Again we are pleased to record that the exhibition of street railway appliances at the meeting was a most pronounced success, and its extent was only limited by the space available for the purpose; in fact, the exhibit would have been much larger if additional space could have been secured.

The importance of these displays of the most recent improvements in apparatus and details of construction and equipment is not questioned; and as a factor in contributing to the interest in the meetings the usefulness of these exhibits is admitted by all.

We append hereto a list of the exhibitors and also the names of the representatives of manufacturers who were at the meeting:

Adams & Westlake Company, Chicago.
American Car Company, St. Louis.
American Railway Supply Company, New York.
Anchor Post Company, New York.
Automatic Car Switch Company, Dayton, O.

Barney & Smith Car Company, Dayton, O.
Brill Company, J. G., Philadelphia.
Burrowes Company, E. T., Portland, Me.

Cambria Iron Works, Philadelphia.
Central Electric Company, Chicago.
Central Brass Company, St. Louis.
Christensen Engineering Company, Milwaukee, Wis.
Cleveland Frog and Crossing Company, Cleveland, O.
Cleveland Construction Co., Akron, O.
Clonbrock Steam Boiler Company, Brooklyn, N. Y.
Consolidated Car Heating Company, Albany, N. Y.
Consolidated Car Fender Company, Providence, R. I.
Columbia Machine Works, Brooklyn, N. Y.
Corning Brake Shoe Company, Buffalo, N. Y.
Crane Company, Chicago.
Creaghead Engineering Company, Cincinnati, O.
Cutter Electrical and Manufacturing Company, Philadelphia.

Detroit Stove Works, Detroit, Mich.
Diamond Truck and Car Gear Company, Kingston, N. Y.

Duff Manufacturing Company, Allegheny, Pa.
Duquesne Forge Company, Pittsburg.
D. & W. Fuse Company, Providence, R. I.

Edison-Brown Plastic Rail Bond, New York.
Electric Mutual Casualty Association, Philadelphia.
Electric Storage Battery Company, Philadelphia.
Ellis, W. F., Boston.

Falk Manufacturing Company, Milwaukee, Wis.
Fellison, Abe., York, Pa.
Forsyth Brothers & Company, Chicago.
Fuel Economizer Company, Matteawan, N. J.

General Electric Company, Schenectady, N. Y.
Gold Car Heating Company, New York.
Graham-Woodward Equipment Company, New York.

International Register Company, Chicago.

Johnson Company, Lorain, O.
Johns Company, H. W., New York.
Joyce-Cridland Company, Dayton, O.

Kuhlman Company, G. C., Cleveland, O.

Long, D. N., Buffalo, N. Y.

Meaker Manufacturing Company, Chicago.
Mica Insulator Company, Chicago.
Milwaukee Rail Joint Company, Milwaukee, Wis.
Monarch Stove Company, Mansfield, O.
Murphy Manufacturing Company, Pittsburg.

McCardell, West & Company, Trenton, N. J.
McGuire Manufacturing Company, Chicago.
McMullen Woven Wire Fence Company, Chicago.
McRoy, John T., Chicago.

Newcomb, F. H., Brooklyn, N. Y.
New Haven Car Register Company, New Haven, Conn.
New York Car Wheel Works, Buffalo, N. Y.
Norton, A. O., Boston.
Nuttall Company, R. D., Allegheny, Pa.

Ohio Brass Company, Mansfield, O.

Paper Vending Machine Company, St. Louis.
Pearson Jack Company, New York.
Peckham Motor Truck and Wheel Company, New York.
Pennsylvania Steel Company, Steelton, Pa.
Pettingell-Andrews Company, Boston.
Pomeroy & Fischer, New York.
Pratt & Letchworth Company, Buffalo, N. Y.

Sargent Company, Chicago.
Sharp, Edward P., Buffalo, N. Y.
Scott Spring Company, Charles, Philadelphia.
Sinclair, D. J., Caledonia, N. Y.
Skeen Electric Switch and Signal Company, St. Louis.
St. Louis Register Company, St. Louis.
Springfield Manufacturing Company, Bridgeport, Conn.
Standard Air Brake Company, New York.
Standard Underground Cable Company, Pittsburg.
Street Railway Journal, New York.
Street Railway Review, Chicago.

Taunton Locomotive Manufacturing Company, Taunton, Mass.
Taylor Electric Truck Company, Troy, N. Y.
Trojan Button Fastener Company, Troy, N. Y.

Van Dorn Company, W. T., Chicago.

Walker Company, The, Cleveland, O.
Watson & Stillman Company, New York.
Weber Rail Joint Company, New York.
Wells & French Company, Chicago.
Westinghouse Electric and Manufacturing Company, Pittsburg.
Wharton, Jr. & Company, Incp., William, Philadelphia.
Whitman & Company, Clarence, New York.
Wood, C. N., Boston.

REPRESENTATIVES OF MANUFACTURERS.

Below are given the names and business of the representatives of manufacturers who attended the meeting, as shown by the register of the Association:

Ackerman, P. C., American Electrical Works, New York.
Ackley, Charles S., Peckham Motor Truck and Wheel Co., New York.
Adams, H. E., Central Electric Co., Chicago.
Adams, W., E. P. Morris, New York.

Adsit, J. O., Buffalo Engineering Co., Buffalo.
Ahearn, T., Ahearn & Soper, Ottawa, Ont.
Aitkin, J. H., General Electric Co., New York.
Allan, J. B., The E. P. Allis Co., Chicago.
Allen, Norman G., American Dist. Steam Co., Lockport.
Allison, Giles S., St. Louis Register Co., New York.
Angel, W. A., Pratt & Letchworth Co., Buffalo.
Angerer, Victor, Wm. Wharton, Jr. & Co., Incp., Philadelphia.
Anthony, J. S., Walker Co., Cleveland.
Anthony, Willis M., New Haven Car Register Co., New Haven.
Archer, H. H., J. G. Brill Co., Philadelphia.
Armstrong, F. C., Canadian General Electric Co., Ltd., Toronto.
Arthur, C. B., Electric Railway Material, Cleveland.
Atkinson, J. M., J. M. Atkinson & Co., Chicago.
Austin, M. B., Safety Insulated Wire and Cable Co., Chicago.

Babcock, J. H., American Dist. Steam Co., Lockport.
Bailey, George C., John A. Roebling's Sons Co., Chicago.
Bailey, Theodore P., General Electric Co., Chicago.
Bain, W. G., Walker Co., Philadelphia.
Baird, John H., Joseph Dixon Crucible Co., Jersey City.
Baker, Frank B., American Electrical Works, New York.
Balch, John, Electrical Engineer, New York.
Baldwin, R. A., New York Switch and Crossing Co., Hoboken.
Baly, John, Murphy Mfg. Co., Pittsburg.
Banks, William E., Gold Street Car Heating Co., New York.
Barber, A. G., Valentine & Co., New York.
Barbour, F. F., General Electric Co., San Francisco.
Barbour, R. P., Rochester Hose Bridge Co., Rochester.
Barr, B. M., Walker Co., Cleveland.
Barr, Harry P., Electrical Engineer, New York.
Barrett, J., Duff Mfg. Co., Allegheny.
Barry, Charles D., Henry W. Peabody & Co., New York.
Barry, J. G., General Electric Co., New York.
Bartholomew, William S., Adams & Westlake Co., Chicago.
Baxter, E. C., Monarch Stove & Mfg. Co., Mansfield.
Baxter, Frederick C., Monarch Stove and Mfg. Co., Mansfield.
Beach, H. E., Gold Street Car Heating Co., New York.
Beach, R. H., General Electric Co., New York.
Beadle, Edward, Railway Register Mfg. Co., New York.
Beran, T., General Electric Co., New York.
Bibber, Charles E., Bibber-White Co., Boston.
Bibber, W. E., Walker Co., Boston.
Bigelow, H. T., Hale & Kilburn Mfg. Co., Chicago.
Binning, Robert E., New Process Raw Hide Co., Syracuse.
Bissell, David S., Duquesne Forge Co., Pittsburg.

Black, Charles H., Walker Co., Cleveland.
Blewett, Scott H., Missouri Car and Foundry Co., St. Louis.
Blizard, Charles, Electric Storage Battery Co., New York.
Blood, John Balch, Blood & Hale, Boston.
Boughton, W. E., Johnson Co., Philadelphia.
Bowen, John, John Bowen & Co., Newark.
Bowman, W. P., John A. Roebling's Sons Co., Cleveland.
Boyd, F. C., New Haven Car Register Co., New Haven.
Boyles, T. D., General Electric Co., New York.
Bradbury, J. Y., Electric Storage Battery Co., Philadelphia.
Bradley, John S., New Haven Car Register Co., New Haven.
Bradt, S. W., Bradt & Zimmerman, Troy.
Brady, Paul T., Westinghouse Electric and Mfg. Co., Syracuse.
Bragg, C. A., Westinghouse Electric and Mfg. Co., Philadelphia.
Brandon, George F., Brandon Accident Brake, Utica.
Briggs, F. R., Mehling Mfg. Co., Cleveland.
Brill, Edward, J. G. Brill Co., Philadelphia.
Brill, John A., J. G. Brill Co., Philadelphia.
Brooks, Franklin, Mica Insulator Co., New York.
Brown, C. R., Pratt & Letchworth Co., Buffalo.
Brown, E. M., General Electric Co., New York.
Brown, George M., Pearson Jack Co., New York.
Brown, Harold P., Plastic Rail Bond, New York.
Brown, J. Alexander, "The Pocket List," New York.
Brown, R. S., Westinghouse Electric and Mfg. Co., Boston.
Brown, W. H., International Register Co., Chicago.
Browne, C. H., Van Wagoner & Williams Co., Cleveland.
Brownell, F. B., Brownell Car Co., St. Louis.
Buehler, J. G., Columbia Machine Works, Brooklyn.
Bulkley, J. N., General Electric Co., New York.
Burleson, W. E., F. W. Oliver & Co., Niagara Falls.
Burns, Charles T., Charles T. Burns & Co., Rochester.
Bushnell, Edwin M., Bushnell Mfg. Co., Easton.
Bushnell, W. G., General Electric Co., New Haven.
Byrns, Robert A., Walker Co., Cleveland.

Cabot, J. A., Creaghead Engineering Co., Cincinnati.
Caldwell, R. L., Walker Co., Cleveland.
Calhoun, W. S., E. T. Burrowes Co., Portland.
Calley, Jr., B. F., H. L. Bowden & Co., Boston.
Campbell, L. A., Canadian General Electric Co., Ltd., Toronto.
Candee, Willard L., Okonite Co., New York.
Carey, W. G., General Electric Co., New York.
Carpenter, Reid, Card Electric Co., Mansfield, O.
Case, Frank E., General Electric Co., New York.
Case, Frederick R., Hoopes & Townsend, Philadelphia.

Castle, Charles C., Hildreth Varnish Co., New York.
Challen, P. J., Fuel Economizer Co., Matteawan, N. J.
Chappell, A. N., New Haven Car Register Co., New Haven.
Chase, J. D., Chase Construction Co., Detroit.
Chase, Samuel A., Western Electric Co., New York.
Christensen, N. A., Christensen Engineering Co., Milwaukee.
Christy, Will, Cleveland Construction Co., Akron.
Chur, Walter, American Railway Institute Co., New York.
Church, Townsend V., Julian L. Tate & Co., Chicago.
Clark, Francis L., Clark Brake Co., Pittsburg.
Clark, Frank H., Electric Storage Battery Co., Philadelphia.
Clark, Horace S., Clark Brake Co., Pittsburg.
Clark, W. J., General Electric Co., New York.
Clitz, R., Johnson Co., Boston.
Coburn, L. J., Smith & Wallace, Boston.
Cockey, M. R., John A. Roebling's Sons Co., New York.
Coleman, Charles E., Eugene Munsell & Co., Chicago.
Coleman, Jilson J., St. Louis Car Co., Allentown, Pa.
Collins, George F., McGuire Mfg. Co., Chicago.
Condit, Jr., Sears B., L. A. Chase & Co., Boston.
Connors, N. M., N. Y. Switch and Crossing Co., Hoboken.
Conway, M. W., N. Y. Switch and Crossing Co., New York.
Cooke, W. J., McGuire Mfg. Co., Chicago.
Cosper, W. P., Consolidated Car Heating Co., Albany.
Coster, Maurice, Westinghouse Electric and Mfg. Co., Chicago.
Crafts, Samuel D., Walker Co., New York.
Crane, J. O., Holmes, Booth & Haydens, New York.
Crane, Jr., Richard T., Crane Co., Chicago.
Cravath, J. R., Cravath Mfg. Co., Chicago.
Crider, J. S., Washington Carbon Co., Pittsburg.
Cross, J. W., U. S. Headlight Co., Utica.
Crowley, H. J., General Electric Co., Philadelphia.
Curwen, Samuel M., J. G. Brill Co., Philadelphia.

Daggett, Jr., H. M., Lombard Hydraulic Brake, Boston.
Daly, John, Murphy Varnish Co., Pittsburg.
Daniels, A. L., H. B. Camp Co., Aultman, O.
Darlington, Frederick W., Consulting Electrical Engineer, Philadelphia.
Dayton, James B., Trenton Malleable Iron Co., Trenton.
Dean, D. B., Terre Haute Car Mfg. Co., Terre Haute.
Dee, A. V., Schillister Co., New York.
Delaney, W. H., Manufacturers' Agent, New York.
Demary, R. C., Akron Electrical Mfg. Co., Akron.
Deming, Frederick C., Carnegie Steel Co., Pittsburg.
Devens, Richard, Weber Railway Joint Mfg. Co., New York.
Dew, F. A., Monarch Stove and Mfg. Co., Mansfield.

de Witt, E. F., E. F. de Witt & Co., Lansingburgh.
Dewson, Jr., Edward H., Standard Air Brake Co., New York.
Dodd, S. T., Walker Co., Cleveland.
Dolph, John C., John C. Dolph & Co., New York.
Donaldson, J. A., Mertes Mfg. Co., Allegheny.
Donohue, Francis E., American Electrical Works, Chicago.
Dowdell, Augustus, Valentine & Co., New York.
Downes, L. W., D. & W. Fuse Co., Providence.
Doyle, J. F., Pullman Co., Pullman.
Doyle, W. L., John A. Roebling's Sons Co., Trenton.
Drake, John I., Hope Electric Appliance Co., Providence.
Dressler, W. F., "Kleanit" Co., Akron.
Dunlap, W. H., Westinghouse Electric and Mfg. Co., Pittsburg.
Durand, S. B., Milwaukee Rail Joint and Welding Co., Milwaukee.
Durel, P. S., Christensen Engineering Co., Milwaukee.
Dutton, W. A., Dorner & Dutton Co., Cleveland.

Edson, H. C., Pratt & Letchworth Co., Buffalo.
Elliott, W. H., Elliott Frog and Switch Co., East St. Louis.
Ellis, William F., Ramapo Iron Works, Boston.
Emmons, A. P., Wendell & MacDuffie, Boston.
Entwisle, E. B., Johnson Co., Lorain.
Entz, Justus B., Electric Storage Battery Co., Philadelphia.
Estabrook, H. M., Barney & Smith Car Co., Dayton.
Estep, Frank A., R. D. Nuttall Co., Allegheny.
Evans, E. O., Contractor, New York.
Evans, H. C., Johnson Co., New York.
Evans, O. C., Johnson Co., Lorain.
Ewing, George C., Bryan-Marsh Co., Boston.

Fairchild, C. B., Standard Air Brake Co., New York.
Falk, Herman W., Falk Mfg. Co., Milwaukee.
Faust, William K., Leonhardt Wagon Mfg. Co., Baltimore.
Fearey, Thomas H., General Electric Co., Buffalo.
Fellison, Abe, Car Fender, York, Pa.
Ferguson, T. W., Walker Co., Cleveland.
Ferguson, W. L., Central Union Brass Co., St. Louis.
Ferguson, W. S., Pittsburg Reduction Co., Pittsburg.
Field, Arthur W., Peckham Motor Truck and Wheel Co., Boston.
Field, H. G., Field & Hinchman, Detroit.
Fish, C. A., George Kissam & Co., New York.
Fisher, E. G., McMullen Woven Wire Fence Co., Chicago.
Fisher, G. E., Chase Construction Co., Detroit.
Flanders, Charles Y., Morris, Tasker & Co., New York.
Fletcher, E. C., E. P. Sharp, Buffalo.
Ford, O. R., Chicago Varnish Co., New York.

Forsyth, G. H., Forsyth Bros. & Co., Chicago.
Forsyth, W. H., Forsyth Bros. & Co., Chicago.
Foster, Horatio A., Consulting Engineer, Buffalo.
Frenyear, T. C., Westinghouse Electric and Mfg. Co., Buffalo.
Fuller, F. G., Okonite Co., New York.

Gagnon, Jr., C. E., Gagnon, Spragge & Co., Montreal.
Gardam, J. N., Peckham Motor Truck and Wheel Co., New York.
Garl, M., Garl Electric Co., Akron.
Garratt, Allan V., Lombard Water Wheel Governor Co., Boston.
Garrison, A. C., Columbia Incandescent Lamp Co., St. Louis.
Garton, W. R., Central Electric Co., Chicago.
Gates, J. Holt, Walker Co., Chicago.
Gay, H. B., Walker Co., Baltimore.
Gayley, Oliver C., Safety Car Heating and Lighting Co., New York.
Gent, William, F. W. Oliver & Co., Niagara Falls.
Gerry, Roland, Jones & Laughlins, Ltd., Pittsburg.
Ghegan, John J., J. H. Bunnell & Co., New York.
Giblin, John, Springfield Emery Wheel Co., Bridgeport.
Gilman, Charles S., National Lead Co., Cleveland.
Glover, Samuel W., Post-Glover Electric Co., Cincinnati.
Gold, E. H., Gold Street Car Heating Co., New York.
Gordon, J. R., Westinghouse Electric and Mfg. Co., Atlanta.
Granger, Francis, Corning Brake Shoe Co., Buffalo.
Granger, John A., New York Car Wheel Works, Buffalo.
Grauten, William A., Electrical Engineer, Hartford.
Gray, E. W. F., Westinghouse Electric and Mfg. Co., Pittsburg.
Gray, Louis A., Adams & Westlake Co., Chicago.
Gray, W. H., Peckham Motor Truck and Wheel Co., Chicago.
Green, W. C., Henry R. Worthington, Cincinnati.
Greene, C. E., High Insulation Line Material, Niagara Falls.
Grier, H. M., Pantasote Leather Co., New York.
Griffin, J. C., Crosby Line Steamers, Milwaukee.
Griffin, P. H., New York Car Wheel Works, Buffalo.

Haasis, A. L., Joseph Dixon Crucible Co., Jersey City.
Hale, G. H., Consolidated Car Fender Co., Providence.
Hale, Irving, General Electric Co., Denver.
Hall, T. A., Walker Co., Cleveland.
Hallett, R. C., Hildreth Varnish Co., New York.
Ham, A. W., Ham Sand Box, Troy.
Ham, H. B., Heine Safety Boiler Co., Boston.
Ham, R. H., Trojan Button Fastener Co., Troy.
Hanna, J. A., Peckham Motor Truck and Wheel Co., Chicago.
Hanon, George, General Electric Co., New York.
Harding, H. McL., Walker Co., New York.

Harrington, F. W., India Rubber and Gutta Percha Insulating Co., New York.
Harrington, S. H., Harrington Rail Bonding Co., New York.
Harris, C. C., Illinois Steel Co., Cleveland.
Harris, E. P., Mechanical Engineer, Dunkirk.
Hartwell, Arthur, Westinghouse Electric and Mfg. Co., Pittsburg.
Haskell, G. M., J. G. Brill Co., Hartford.
Haskins, Caryl D., General Electric Co., Boston.
Hathaway Alfred G., Electric Railway Material, Cleveland.
Hatley, George H., Pratt & Lambert, Cincinnati.
Haycox, W. E., Fulton Truck and Foundry Co., Cleveland.
Hayes, Scott, Hayes & Arthur, Cleveland.
Heathcote, W., Canadian General Electric Co., Ltd., Toronto.
Heinrichs, E. H., Westinghouse Electric and Mfg. Co., Pittsburg.
Hemingway, D. C., Hemingway Glass Co., Covington.
Henry, O. D., Steel Motor Co., Johnstown.
Hernandez, J., Adam Cook's Sons, New York.
Herr, Arthur T., Sargent Co., Chicago.
Heth, John D., Taunton Locomotive Mfg. Co., Taunton.
Heulings, Jr., W. H., J. G. Brill Co., Philadelphia.
Hicks, John B., Pratt & Lambert, New York.
High, John M., Pantasote Co., New York.
Hinchman, Jr., T. H., Field & Hinchman, Detroit.
Hinds, F. C., F. C. Hinds & Co., Boston.
Hirsch, Herman, C. Buschner's Roller Bearing, New York.
Hodgkins, Edward E., The Q. & C. Co., Chicago.
Holbrook, Percy, Weber Railway Joint Mfg. Co., New York.
Hood, Charles O., R. Bliss Mfg. Co., Pawtucket.
Horner, F. E., F. E. Horner & Co., New York.
Hubbard, Jr., M. G., McGuire Mfg. Co., Chicago.
Hubbard, O. M., Bradford Belting Co., Cincinnati.
Hunter, Lytle J., Hunter Illuminated Sign Co., Cincinnati.
Huntress, F. E., Barney & Smith Car Co., Dayton.
Hurd, G. A., Crane Co., Chicago.
Hurst, Willis T., Monarch Stove and Mfg. Co., Mansfield.
Hutchins, A. W., D. & W. Fuse Co., Providence.
Hutton, E. F., Diamond Truck and Car Gear Co., Kingston.

Issertel, Henry G., Walker Co., New York.
Ives, William M., Leonhardt Wagon Mfg. Co., Baltimore.

Jaastad, A. U., Sheaff & Jaastad, Boston.
Jackman, George W., Springfield Mfg. Co., Bridgeport.
Jackson, John, Simonds Mfg. Co., Pittsburg.
Jackson, J. Monteith, Jackson & Sharp Co., Wilmington.
Jackson, Newton, American Mutual Indemnity Co., Scranton.

Jacob, W. H., Card Electric Co., Mansfield.
Jens, William, Johnson Co., St. Louis.
Johnson, Henry C., Charles Scott Spring Co., Philadelphia.
Johnson, W. L., Walker Co., Toronto.
Jones, B. J., Sargent & Lundy, Chicago.
Jones, C. S., Western Glass Co., Milwaukee.
Jones, Jr., J. M., J. M. Jones' Sons, West Troy.

Kappesser, J. F., General Electric Co., New York.
Kauffman, W. J., Kauffman-Conkell Co., Canton.
Kavanagh, J. E., Wm. Wharton, Jr., & Co., Incp., Philadelphia.
Keeler, H. E., Adams & Westlake Co., Chicago.
Kernochan, Jr., H. P., General Electric Co., New York.
Kerschner, W. R., Columbia Machine Works, Brooklyn.
Kiely, H. J., Link-Belt Engineering Co., New York.
Kimball, Frederick M., General Electric Co., Boston.
King, C. K., Ohio Brass Co., Mansfield.
Kingston, William W., Johnson Co., Atlanta.
Kirby, Jr., John, U. S. Headlight Co., Utica.
Kirkland, H. B., Cutter Electric and Mfg. Co., New York.
Kissam, George, George Kissam & Co., New York.
Knickerbocker, C. K., Griffin Wheel Co., Chicago.
Kuhl, J. G., Mitchell Tempered Copper Co., Corry, Pa.
Kuhlman, G. C., G. C. Kuhlman Co., Cleveland.

La Marr, W. H., Duplex Supply Co., New York.
Lane, R. T., Steel Motor Co., Johnstown.
Langdon, C. J., Fulton Truck and Foundry Co., Cleveland.
Lapham, Frank A., Cleveland Frog and Crossing Co., Cleveland.
Laughlin, F. M., Solar Carbon and Mfg. Co., Pittsburg.
Lavins, E., General Inc. Arc Light Co., New York.
Lawless, E. J., American Car Co., New York.
Lawrence, F. D., Standard Electrical Works, Cincinnati.
Leidenger, Joseph, Dayton Mfg. Co., Dayton.
Leidenger, Peter, Dayton Mfg. Co., Dayton.
Leschen, Henry, Leschen-Macomber-Whyte Co., Chicago.
Letchworth, O. P., Pratt & Letchworth Co., Buffalo.
Lex, Frederic A., Lobdell Car Wheel Co., Wilmington.
Lindsay, H. J., Carnegie Steel Co., Ltd., Pittsburg.
Littlefield, A. S., Johnson Co., Chicago.
Livingston, M. L., Standard Therm. and Electric Co., Peabody, Mass.
Lloyd, Herbert, Electric Storage Battery Co., Philadelphia.
Lockwood, James E., General Electric Co., Detroit.
Loichot, L. A. L., Kauffman-Conkell Co., Canton.
Long, D. N., Acetylene Gas Headlight, La Salle, N. Y.
Long, E. G., Peckham Motor, Truck and Wheel Co., New York.

Loper, A. N., New Haven Car Register Co., New Haven.
Lowell, John A., Duplex Car Co., Boston.
Lucas, G. C., Cleveland Frog and Crossing Co., Cleveland.
Ludington, R. B., Columbia Refining Co., New York.
Ludlow, W. E., American Rail Joint and Mfg. Co., Cleveland.
Luscomb, H. C., Johns-Pratt Co., Hartford.
Luther, Henry R., Barbour-Stockwell Co., Cambridge, Mass.
Lyford, G. B., Westinghouse Electric and Mfg. Co., Pittsburg.
Lyford, Jr., O. S., Westinghouse Electric and Mfg. Co., Pittsburg.
Lyman, H. M., Mechanical Engineer, Cleveland.
Lynn, A. W., Milwaukee Rail Joint and Welding Co., Milwaukee.

MacDuffie, R. L., Wendell & MacDuffie, New York.
MacGovern, Frank, Rossiter, MacGovern & Co., New York.
MacLaren, Malcolm, Westinghouse Electric and Mfg. Co., Pittsburg.
Mahoney, C. L., Pennsylvania Steel Co., Philadelphia.
Mallett, J. P., Westinghouse Electric and Mfg. Co., Pittsburg.
Mann, Albert, Electrical Engineer, Buffalo.
Many, Frank B., Mehling Mfg. Co., Cleveland.
Marshall, C. F., Christensen Engineering Co., Milwaukee.
Mathes, G. D., Walker Co., Cleveland.
Maxwell, E. L., Dilworth, Porter & Co., Ltd., Pittsburg.
McCardell, J. R., McCardell, West & Co., Trenton.
McCarthy, Norman, American Rail Joint Co., Cleveland.
McCormack, E. D., Canadian General Electric Co., Ltd., Toronto.
McCoy, Frank, Pittsburg Car Wheel Co., Pittsburg.
McElroy, James F., Consolidated Car Heating Co., Albany.
McGhie, John, General Electric Co., New York.
McGuire, W. A., McGuire Mfg. Co., Chicago.
McIlvain, E. M., Bethlehem Iron Co., So. Bethlehem, Pa.
McIntosh, D. F., Partridge Carbon Co., Pittsburg.
McLaughlin, W. E., Automatic Block Signal Co., New York.
McLeod, N. R., Washburn & Moen Mfg. Co., Worcester.
McRoy, John T., Vitrified Clay Conduits, Chicago.
Meachem, T. W., New Process Raw Hide Co., Syracuse.
Meaker, J. W., Meaker Mfg. Co., North Chicago.
Meek, J. Emory, H. W. Johns Mfg. Co., New York.
Mensch, C. E., Skeene Electric Switch and Signal Co., St. Louis.
Mercur, H. T., Corning Brake Shoe Co., Buffalo.
Merrick, F. R., Blood & Hale, Boston.
Moore, Jr., Alexander T., Walker Co., Pittsburg.
Moore, George, Duplex Car Co., Boston.
Morrell, A. W., Miller-Knoblock Co., So. Bend, Ind.
Morrell, Frank A., Sterling Supply and Mfg. Co., New York.
Morrin, Thomas F., Clonbrock Steam Boiler Co., Brooklyn.
Morris, Elmer P., Electric Railway Supplies, New York.

Morse, George C., Rochester Car Wheel Works, New York.
Mulford, O. J., Street Car Advertising, Detroit.
Murdock, H. L., O. R. Sackett & Co., Niagara Falls.
Murray, David, E. T. Burrowes Co., Portland, Me.
Myers, Garson, Christensen Engineering Co., Milwaukee.

Naugle, E. E., Naugle, Holcomb & Co., Chicago.
Nethercut, Edgar S., Paige Iron Works, Chicago.
Newcomb, F. H., Conductors' Caps, Brooklyn.
Newton, J. D., Swan & Finch, New York.
Norton, Harry A., Norton Jack, Boston.

Oliver, F. W., F. W. Oliver & Co., Niagara Falls.
Oswald, Edwin H., Benedict & Burnham Mfg. Co., Waterbury.

Parker, Lee H., General Electric Co., New York.
Parsons, Charles, Buda Foundry and Machine Co., Chicago.
Parsons, J. N., A. Mertes Mfg. Co., Allegheny.
Partidge, Arthur S., Electrical Supplies, St. Louis.
Partridge, J. N., Okonite Co., New York.
Partridge, James, Partridge Carbon Co., Sandusky.
Partridge, W. E., Mechanical Engineer, New York.
Peckham, Edgar, Peckham Motor Truck and Wheel Co., New York.
Pfingst, Louis, Electrical Supplies, Boston.
Pike, F. N., Hygeia Hotel, Old Point Comfort.
Polk, R. K., Wm. Wharton, Jr., & Co., Incp., Philadelphia.
Pomeroy, Joseph, Pomeroy & Fischer, New York.
Porter, George F., Okonite Co., New York.
Post, W. B., Billings & Spencer Co., Hartford.
Potter, D. F., General Electric Co., Buffalo.
Potter, W. B., General Electric Co., Schenectady.
Powell, A., Cleveland Frog and Crossing Co., Cleveland.
Prather, Henry L., Falk Mfg. Co., Milwaukee.
Pratt, H. T., Washburn & Moen Mfg. Co., Worcester.
Price, E. F., Acetylene Light, Heat and Power Co., Niagara Falls.
Price, W. G., Wells & French Co., New York.
Priest, E. D., General Electric Co., Schenectady.
Provost, George W., R. D. Nuttall Co., Allegheny.
Pugh, D. W., John Stephenson Co., Ltd., New York.
Pullen, C. L., Lobdell Car Wheel Co., New York.
Pullen, F. T., Diamond Truck and Car Gear Co., New York.
Purves, T. B., Boston & Albany Railroad, Boston.

Quigg, H. J., Erie Railroad, Newburgh.

Randall, F. C., Christensen Engineering Co., Hartford.
Ransom, H. N., Consolidated Car Heating Co., Albany.

Reeve, Frederick C., Plastic Rail Bond, New York.
Reinoehl, C. W., Pennsylvania Steel Co., Steelton.
Reno, Charles Stowe, Triumph Electric Co., Cincinnati.
Reynolds, A. T., Taylor Electric Truck Co., Troy.
Rhodes, J. D., Pittsburg Car Wheel Co., Pittsburg.
Rice, Franklin, Dayton Automatic Car Switch Co., Dayton.
Richards, E. J., Hudson River Power Transmission Co., Mechanicsville.
Richards, H. T., Safety Insulated Wire and Cable Co., New York.
Richardson, Charles A., Worcester Construction Co., Worcester.
Robert, Louis E., Sterling Supply and Mfg. Co., New York.
Roberts, E. P., E. P. Roberts & Co., Cleveland.
Roberts, F. W., Steel Motor Co., Johnstown.
Robinson, D. H., East. Pass. Agt., "Bay Line," New York.
Robinson, E. E., Standard Air Brake Co., New York.
Robinson, Edward I., Laclede Car Co., St. Louis.
Robinson, John C., Harrington, Robinson & Co., Boston.
Roche, D. L., Charles Scott Spring Co., Philadelphia.
Rooke, George F., Rooke Register Co., Boston.
Rosenthal, George D., General Electric Co., St. Louis.
Rusling, F. O., Hildreth Varnish Co., Lawrenceville, Pa.
Russell, F. D., Rochester Car Wheel Works, Rochester.
Russell, Harry H., E. T. Burrowes Co., Portland, Me.
Russell, P. G., Prindle & Russell, Buffalo.
Russell, W. H., Russell Mfg. Co., Chicago.
Rutherford, J. A., Steel Motor Co., Johnstown.

Sackett, H. J., Electrical Supplies, Buffalo.
Sackett, O. R., Sackett Trolley Pole Catcher, Niagara Falls.
Sammens, Charles H., Clonbrock Steam Boiler Co., Brooklyn.
Sanford, George H., Platt & Washburn Roofing Co., New York.
Sargent, Fitz-William, Sargent Co., Chicago.
Sargent, George H., Sargent Co., Chicago.
Savage, F. T., Columbia Refining Co., New York.
Saxelby, Frederick, Wells & French Co., New York.
Sayre, L. A., L. A. Sayre & Co., Newark.
Schlegel, Robert A., Paper Vending Machine Co., St. Louis.
Schultz, Charles S., Dick, Kerr & Co., Ltd., London, Eng.
Schutt, Henry L., Detroit Stove Works, Detroit.
Schuyler, Herman P., General Electric Co., Schenectady.
Scott, William M., Cutter Electrical and Mfg. Co., Philadelphia.
Scrugham, George R., Creaghead Engineering Co., Cincinnati.
Sears, J. P., Composite Brake Shoe Co., Boston.
Seguine, W. P., Joel H. Woodman, Hoboken, N. J.
Sessions, E. O., Frank Jones Electric Department, Portsmouth, N. H.
Shainwald, J. C., Standard Paint Co., Chicago.
Sharp, Edward P., R. D. Nuttall Co., Buffalo.

Sheble, Franklin, Plastic Rail Bond, Philadelphia.
Shippey, H. L., John A. Roebling's Sons Co., New York.
Short, Sidney H., Walker Co., Cleveland.
Siegfried, Robert, Westinghouse Electric and Mfg. Co., Pittsburg.
Silk, A. E., Jewell Belting Co., Hartford.
Silver, William S., William S. Silver & Co., New York.
Sinclair, D. J., Sinclair Automatic Coupler, Caledonia, N. Y.
Skeen, Robert, Skeen Electric Switch and Signal Co., St. Louis.
Sloat, F. J. J., Cleveland Construction Co., Akron.
Smith, Herbert W., Smith & Wentworth, Boston.
Smith, Pemberton, New York Car Wheel Works, Buffalo.
Smith, William M., Chicago Insulated Wire Co., Chicago.
Smith, W. Nelson, Electrical Engineer, Watertown, N. Y.
Snow, F. William, Valentine & Co., Chicago.
Snow, G. C., Cleveland Frog and Crossing Co., Cleveland.
Spaulding, H. C., Siemens & Halske Electric Co., Chicago.
Spencer, E. J., Safety Insulated Wire and Cable Co., St. Louis.
Starr, David A., Electrical Engineer, Cornwall, Ont.
Stearns, Charles O., Duplex Car Co., Boston.
Stearns, W. H., Pennsylvania Steel Co., Chicago.
Stedman, J. H., Transfer Tickets, Rochester.
Stevens, J. F., Keystone Electrical Inst. Co., Philadelphia.
Stillman, F. H., Watson & Stillman Co., New York.
Storer, F. K., Westinghouse Electric and Mfg. Co., Pittsburg.
Storer, N. W., Westinghouse Electric and Mfg. Co., Pittsburg.
Storey, I. E., Storey Motor and Tool Co., Philadelphia.
Strieby, F. H., General Electric Co., Cincinnati.
Surritt, Charles A., Mertes Mfg. Co., Allegheny.
Sutton, William, American Car Co., St. Louis.
Swan, G. W., John A. Roebling's Sons Co., New York.
Swartz, B. F., McKee, Fuller & Co., Catasauqua, Pa.
Sweet, D. C., Car Wheel Grinding Machinery, Springfield.

Tackaberry, John A., John Stephenson Co., Ltd., New York.
Tandy, L. D., General Electric Co., Schenectady.
Taylor, John, Taylor Electric Truck Co., Troy.
Ten Broeck, William H., Diamond Truck and Car Gear Co., Kingston.
Tenney, A. E., General Electric Co., Atlanta.
Tesseyman, H., Barney & Smith Car Co., Dayton.
Thomas, Joseph N., Steel Motor Co., Johnstown.
Thompson, N. A., Valentine & Co., New York.
Thomson, G. A., Forest City Electric Co., Cleveland.
Thomson, H. G., Anchor Post Co., New York.
Tiffany, William, Sterling Supply and Mfg. Co., New York.
Tillinghast, B. D., Duff Mfg. Co., Pittsburg.
Tolles, C. L., Jewell Belting Co., Hartford.

Tone, Frank J., Carborundum Co., Niagara Falls.
Traverse, James, O. R. Sackett & Co., Niagara Falls.
Trawick, S. W., General Electric Co., Philadelphia.
Trefether, E. T., A. O. Norton, Boston.
Tupper, G. A., Taylor Electric Truck Co., Troy.

Van Dorn, W. T., W. T. Van Dorn Co., Chicago.
Van Wagoner, C. S., Van Wagoner & Williams Co., New York.
Vosburgh, A. C., New Process Raw Hide Co., Syracuse.

Wakefield, R. S., San Antonio Edison Co., San Antonio.
Walbridge, G. H., J. G. White & Co., New York.
Walker, Henry L., Manufacturers' Agent, Detroit, Mich.
Walker, Russell T., Heine Safety Boiler Co., New York.
Wampler, William M., Meaker Mfg. Co., Chicago.
Ward, John E., Gold Street Car Heating Co., New York.
Warner, Edgar E., Milwaukee Rail Joint and Welding Co., Milwaukee.
Warner, Edward D., Parrish Signal Co., Jackson, Mich.
Washburne, William A., Cambria Iron Co., New York.
Wattles, James F., Rand-Avery Supply Co., Boston.
Weaver, S. H., Pittsburg Trolley Pole Co., Pittsburg.
Webb, H. E., Solar Carbon and Mfg. Co., Pittsburg.
Welch, Robert W., John A. Roebling's Sons Co., Trenton.
Wendell, Jr., Jacob, Wendell & MacDuffie, New York.
Wesner, T. H., Walker Co., Cleveland.
Wessels, E. J., Standard Air Brake Co., New York.
Weston, Frederick deB., Gold Street Car Heating Co., New York.
Weston, George, Naugle, Holcomb & Co., Chicago.
Wharton, William W., Electric Mutual Casualty Association, Philadelphia.
Whitcomb, William W., Composite Brake Shoe Co., Boston.
White, T. C., Central Union Brass Co., St. Louis.
White, J. G., J. G. White & Co., New York.
Whitlock, F. B., National Malleable Castings Co., Indianapolis.
Whitney, J. D., Crew-Levick Co., Philadelphia.
Whipp, George S., Contractor, Brooklyn.
Whipple, Bailey, Buckeye Electric Co., Cleveland.
Whyte, George S., Leschen-Macomber-Whyte Co., Chicago.
Wilkinson, Arthur L., Ohio Brass Co., Mansfield.
Wilkinson, W. H., Diamond Truck and Car Gear Co., Kingston.
Williams, B., General Electric Co., New York.
Williams, George W., Composite Brake Shoe Co., Salem.
Wilson, Charles H., Manufacturers' Selling Agent, Boston.
Wilson, J. E., Pettingell-Andrews Co., Boston.
Wind, F. A., Paper Vending Machine Co., St. Louis.
Window, Richard R., Pass. Agent, Old Dominion S. S. Co., New York.

Wise, Clift, General Contractor, Chicago.
Wood, Charles N., Railway Supplies, Boston.
Wood, W. C., New York Switch and Crossing Co., Hoboken.
Woodward, A. H., International Register Co., Chicago.
Woodward, R. Graham, Graham-Woodward Equipment Co., New York.
Woodworth, A. C., Consolidated Car Fender Co., Providence.
Woodworth, Jr., A. C., Consolidated Car Fender Co., Providence.
Wright, G., Westinghouse Electric and Mfg. Co., Pittsburg.
Wright, J. H., Wendell & MacDuffie, New York.
Wurster, E. A., Falk Mfg. Co., Milwaukee.

Yardley, John Howard, Philadelphia Car Wheel Co., Philadelphia.

Zimmerman, J. J., Bradt & Zimmerman, Troy.
Zimmerman, W. F., Westinghouse Electric and Mfg. Co., Pittsburg.
Zweigbergk, Thorsten v., Walker Co., Cleveland.

ENTERTAINMENT.

The entertainment by the local committees of the delegates and ladies at the Convention began almost immediately upon their arrival on Tuesday morning and continued until Saturday noon.

On Tuesday morning the Ladies' Entertainment Committee met the visiting ladies in the parlors of the International Hotel, who were at once made to feel at home. In the afternoon a visit by all in attendance at the Convention was made to the power house of the Niagara Falls Hydraulic Power and Manufacturing Company, the power house of the Niagara Falls Power Company and the factories of the Niagara Falls Paper Company and the Carborondum Company. In the evening there was a reception by the Ladies' Entertainment Committee in the Parlors of the International Hotel.

The Ladies' Entertainment Committee, on Wednesday morning, accompanied the visiting ladies upon a carriage drive about the New York State Reservation and a trip upon the steamer "Maid of the Mist." In the afternoon the entire party proceeded across the upper Suspension Bridge to the Canadian side, where the cars of the Niagara Falls Park

and River Railroad Company conveyed them to Chippewa and thence to Queenston, where the steamer of the Niagara Navigation Company took them across the river to Lewiston. The party then proceeded back to the Falls over the Great Gorge Route. It was to be regretted that the inclement weather marred much of the pleasure of this trip; but it was repeated at different times by almost everyone at the meeting. A musical was given in the evening at the International Hotel, the earlier part of the evening being spent in listening to an entertainment of singing and instrumental music furnished by the ladies of Niagara Falls. This was followed with dancing, which was continued until an early hour in the morning; and the evening was much enjoyed by both participants and onlookers.

A trip for the visiting ladies to Youngstown over the Great Gorge Route and the Frontier Railroad was the entertainment provided for Thursday morning. On Thursday afternoon the General Electric Company provided a tally-ho ride for the ladies.

The annual banquet took place in the evening and was followed by a reception and dancing, which together constituted an evening of much pleasure. It had been planned to illuminate the Rapids on Thursday night after the banquet, but owing to the rain this was postponed. The display, however, was given on Friday night, and was a most charming and inspiring spectacle, the grandeur of the Rapids being heightened by the many-colored lights thrown upon them.

As late as Saturday a number of the attendants at the Convention rode over the Great Gorge Route.

The meeting and entertainment was a most pronounced success, and all who attended the Convention were loath to leave the beautiful surroundings of the Falls. The management of the hotels deserve special thanks for their constant efforts to make their guests comfortable, in which they succeeded to a marked degree.

The several committees in charge of the arrangements for the meeting performed their duties well. They were as follows:

LOCAL COMMITTEES.

GENERAL.

Hon. A. C. Hastings, Mayor, Chairman.

Hon. W. Caryl Ely, President Buffalo and Niagara Falls Electric Railway Co.

Charles B. Hill, Treasurer Niagara Falls and Suspension Bridge Railway Co.

Capt. John M. Brinker, President Niagara Falls and Lewiston Railway Co.

W. A. Heller, Supt. Lewiston and Youngstown Frontier Railroad Co.

John Foy, General Manager Niagara Navigation Co.

Col. Henry M. Watson, President Buffalo Railway Co.

H. H. Littell, President Buffalo Crosstown Railroad Co.

J. M. Bostwick, Treasurer Niagara Falls and Clifton Suspension Bridge Co.

W. Phillips, Superintendent Niagara Falls Park and River Railway Co.

Burt Van Horn, General Manager Buffalo and Niagara Falls Electric Railway Co.

Frank LeBlond, Manager Maid of the Mist Steamboat Co.

Hon. Thomas V. Welch, Superintendent State Reservation.

James Wilson, Superintendent Victoria Niagara Falls Park.

Hon. Arthur Schoellkopf, Secretary and Treasurer Niagara Falls Hydraulic Power and Manufacturing Co.

W. A. Brackenridge, Engineer Niagara Falls Power Co.

Joseph P. Devine,
L. W. Pettibone,
Hon. James Low,
A. H. G. Hardwicke,
Wm. Richmond,
Benj. F. Thurston,
Wm. S. Humbert,
W. H. Barnes,
Walter McCulloch,
Eugene Cary,
Thomas McDowell,
David Isaacs,
H. W. Beardsley,
Gen. Benj. Flagler,
Richard Williamson,
Lawrence Davis,
Andrew Dickey,
John M. Hancock,
James S. Simmons,
E. T. Williams.

EXHIBITS.

H. W. Beardsley,
Joseph K. Brooks,
Burt Van Horn,
J. C. Brewster,
W. A. Heller,
W. Phillips.

BANQUET.

Hon. A. C. Hastings. Hon. W. Caryl Ely. Hon. T. V. Welch.

ENTERTAINMENT.

Gentlemen.

W. S. Humbert,
Hon. James Low,
James S. Simmons,
Walter McCulloch,
David Isaacs,
H. W. Beardsley.

Ladies.

Mrs. W. C. Ely,
Mrs. W. S. Humbert,
Mrs. A. H. G. Hardwicke,
Mrs. George Nye,
Mrs. Burt Van Horn,
Mrs. F. A. Dudley,
Miss Bessie Low,
Miss Grace Cuddaback,
Mrs. J. M. Hancock,
Mrs. M. Cohn,
Mrs. Eli Nichols,
Mrs. F. K. Paddock,
Mrs. H. W. Beardsley,
Mrs. W. W. Reed,
Mrs. W. D. Hough,
Mrs. E. H. Stewart,
Mrs. A. C. Hastings,
Mrs. H. E. Woodford,
Mrs. F. W. Oliver,
Mrs. H. A. Francis,
Mrs. E. T. Williams,
Mrs. N. L. Benham,
Mrs. F. E. Johnson,
Mrs. E. O. Babcock,
Mrs. C. W. Dill,
Mrs. J. C. Morgan,
Mrs. W. Richmond,
Mrs. W. R. Campbell,
Mrs. A. Thibaudeau,
Mrs. Thomas McDowell,
Mrs. W. L. Lamont,
Mrs. W. C. Johnson,
Miss Agnes Mackay,
Miss Mackay,
Miss Rose.

LADIES AT THE CONVENTION.

In addition to the Ladies' Entertainment Committee, the following named ladies were present:

Mrs. H. E. Adams, Chicago.
Mrs. Dee Allen, Battle Creek.
Miss Alpha, Peru.
Mrs. A. A. Anderson, Youngstown.
Mrs. E. W. Ash, Girardville, Pa.
Mrs. Theodore P. Bailey, Chicago.
Mrs. R. F. Baker, Washington.
Mrs. R. H. Beach, East Orange.
Mrs. W. Worth Bean, St. Joseph, Mich.
Mrs. J. A. Bendure, Atchison.
Mrs. Scott H. Blewett, St. Louis.
Mrs. Charles A. Bragg, Philadelphia.
Mrs. E. S. Breed, New Britain.

Mrs. W. Gibson Carey, Schenectady.
Mrs. F. E. Case, New York.
Mrs. Mary E. Chambers, Buffalo.
Mrs. James R. Chapman, Chicago.
Mrs. H. B. Church, Wichita.
Mrs. L. J. Coburn, Boston.
Mrs. Charles Coleman, Chicago.
Mrs. W. J. Cooke, Chicago.
Mrs. William P. Craig, Orange, N. J.
Mrs. T. E. Crossman, Brooklyn.
Mrs. J. L. Crumrine, Cleveland.
Miss Clara Cunningham, St. Louis.

Mrs. H. M. Daggett, Jr., Attleboro.
Mrs. H. J. Davies, Cleveland.
Miss Deming, Buffalo.
Mrs. Harry Dixon, Youngstown.
Mrs. Harvey A. Dixon, Port Huron.
Mrs. G. A. W. Dodge, New Haven.
Mrs. R. M. Douglass, Norristown.
Mrs. Lewis N. Downs, Battle Creek.
Mrs. C. N. Duffy, St. Louis.
Miss Nellie M. Dunning, Deckertown, N. J.
Miss Dunning, Buffalo.

Mrs. W. H. Elliott, East St. Louis.
Miss Entwisle, Johnstown.

Mrs. Thomas Farmer, Jr., Detroit.
Miss Florence Fischer, New York.
Mrs. F. H. Fitch, Carthage, Mo.

Mrs. G. B. Garvin, New York.
Mrs. E. S. Goodrich, Hartford.
Mrs. Charles Green, St. Louis.
Miss Green, St. Louis.

Mrs. Caryl D. Haskins, Boston.
Mrs. Thomas Hawken, Rockland, Me.
Mrs. Charles L. Henry, Anderson, Ind.
Mrs. Frank R. Henry, St. Louis.
Mrs. Charles T. Herrick, Williamsport.
Mrs. W. W. Herrick, Cleveland.
Miss Anna Herrick, Cleveland.
Miss Ella Herrick, Cleveland.
Mrs. E. D. Hibbs, Jersey City.
Mrs. F. C. Hinds, Boston.
Mrs. D. A. House, Buffalo.
Mrs. Will H. Hull, St. Joseph, Mich.
Mrs. H. N. Hunt, Atlanta.

Mrs. Ellen H. James, Lockport.
Mrs. F. G. Jones, Memphis.

Mrs. W. F. Kelly, Columbus.
Mrs. F. S. Kenfield, Chicago.
Mrs. H. J. Kenfield, Chicago.
Mrs. George B. Kerper, Dayton.
Miss Kilgour, Cincinnati.
Mrs. Fred. M. Kimball, Boston.
Miss Kline, Ottawa, Ont.
Mrs. G. C. Kuhlman, Cleveland.

Mrs. Albion E. Lang, Toledo.
Mrs. F. A. Lapham, Cleveland.
Mrs. Herbert Lloyd, Philadelphia.
Miss Lloyd, Philadelphia.
Mrs. H. R. Luther, Cambridge, Mass.

Miss Mallory, Memphis.
Mrs. F. B. Many, Cleveland.
Miss Laura H. Mensch, St. Louis.
Mrs. Thomas Millen, New York.
Mrs. D. S. Moffatt, Brooklyn.
Mrs. John Murphy, Pittsburg.
Mrs. D. Murray, Portland, Me.
Mrs. Frank B. Musser, Harrisburg.
Miss Helen MacFayden, Chester.
Mrs. John MacFayden, Chester.
Mrs. W. K. McAllister, Atlantic City.
Mrs. J. B. McClary, Birmingham.
Miss Edna P. McCormack, Brooklyn.

Mrs. Ira A. McCormack, Brooklyn.
Mrs. Robert McCulloch, St. Louis.
Mrs. William G. McDole, Cleveland.
Mrs. John McGhie, New York.

Mrs. S. L. Nelson, Springfield, O.
Mrs. F. H. Newcomb, Brooklyn.

Mrs. John B. O'Hara, Chicago.

Miss Peckham, New York.
Mrs. F. B. Perkins, Toledo.
Mrs. W. Phillips, Niagara Falls, Ont.
Mrs. A. E. Pond, New Haven.
Mrs. A. T. Potter, Providence.
Mrs. D. Fred Potter, Buffalo.
Mrs. W. B. Potter, Schenectady.

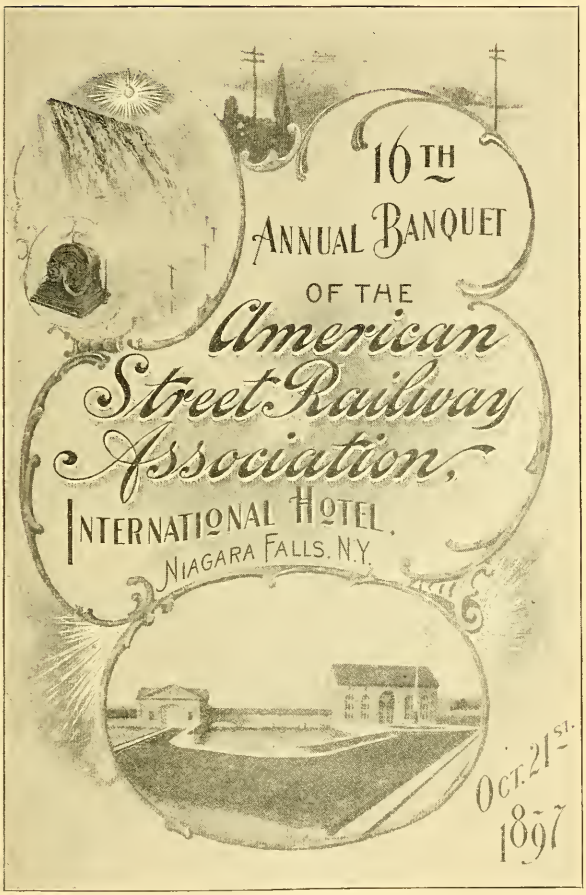
Mrs. W. W. Randall, Brooklyn.
Mrs. C. B. Reavis, Augusta, Ga.
Mrs. John C. Robinson, Boston.

Mrs. H. J. Sackett, Buffalo.
Mrs. F. W. Sargent, Chicago.
Mrs. George H. Sargent, Chicago.
Mrs. L. A. Sayre, Madison, N. J.
Mrs. H. L. Schutt, Detroit.
Mrs. H. P. Schuyler, Schenectady.
Mrs. G. R. Scrugham, Cincinnati.
Mrs. W. S. Scull, Camden.
Miss Gertrude Seguine, Jersey City.
Mrs. Franklin Sheble, Philadelphia.
Mrs. C. L. Short, Worcester.
Mrs. Sidney H. Short, Cleveland.
Mrs. E. A. Simmons, New York.
Mrs. W. Nelson Smith, Watertown.
Miss Stivers, Burlington.
Mrs. A. H. Stone, Worcester.
Mrs. E. K. Stone, Jr., Quincy, Ill.

Mrs. Lewis D. Tandy, Schenectady
Mrs. W. H. Taylor, New York.
Miss E. A. Tripp, Boston.

Miss Van Horn, Lockport.

Mrs. James F. Wattles, Boston.
Mrs. J. N. Wegory, Buffalo.
Mrs. E. J. Wessels, Orange, N. J.
Mrs. George W. Williams, Salem.
Mrs. L. O. Williams, Springfield, O.
Mrs. C. H. Wilson, Boston.
Mrs. Henry H. Windsor, Chicago.


16TH
ANNUAL BANQUET
OF THE
American
Street Railway
Association,
INTERNATIONAL HOTEL,
NIAGARA FALLS, N.Y.
OCT. 21ST.
1897

Menu

Sauterne Cruse & Fils	Blue Points
	Celery
	Consomme Princess
	Soup Rolls
Amontillado Sherry	Boiled Kennebec Salmon, Diplomate
	Potatoes Gastronome
	Salted Almonds Queen Olives Mangoes
	Croquettes of Sweetbreads, Supreme
Veuve Cliquot	Pettis Pois
Piper Heidsieck White Label	Tenderloin of Beef a la Charon
	Browned Sweet Potatoes
	Creme de Menthe Punch
	Roast Larded Quail, Modern
Dry Monopole	Fried Hominy
	Chicken Mayonnaise
	Ice Cream in Forms
	Cake Fruit
	Cheese and Crackers
Cigars	Coffee

Toasts

TOASTMASTER, - HON. W. CARYL ELY

The City of Niagara Falls,

HON. ARTHUR C. HASTINGS

The Association,

MR. SMITH P. GALT

Wit and Humor of the Bar,

MR. HENRY W. BOX

The Evolution of Niagara,

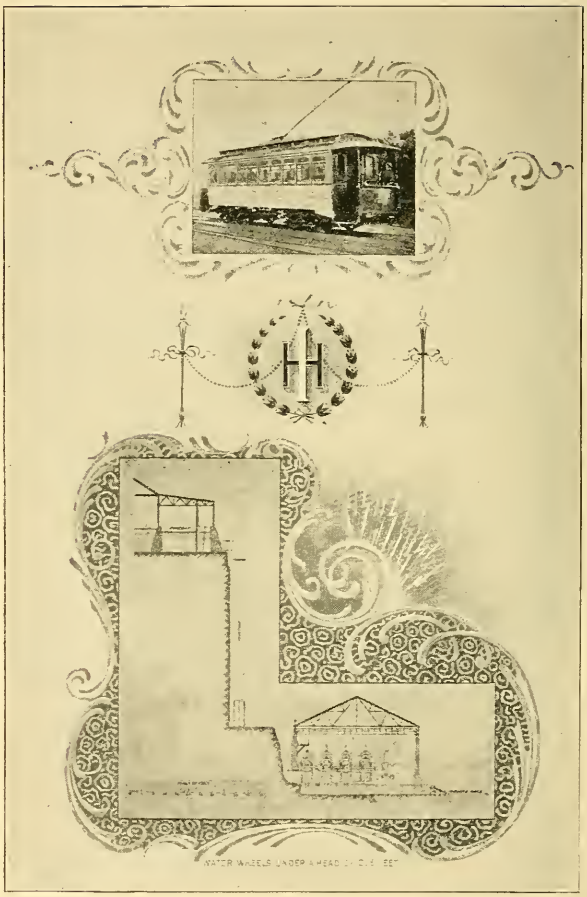
HON. THOMAS V. WELCH

The Railroad Commissioners,

HON. ASHLEY W. COLE

The Technical Press,

MR. HENRY H. WINDSOR



Engd by H.B. Hall's Sons, New York.

T. C. Pennington

BANQUET.

The sixteenth annual banquet was no exception to the high level which these yearly dinners have reached. Covers were laid for three hundred and twenty-five persons, of whom ninety were ladies; and every seat was occupied until the end of the speaking. There was ample accommodation in the large dining-hall, and the service of the menu was speedy. The table at which the officers, speakers and invited guests sat ran crosswise of the room, and the three main tables ran lengthwise. The decorations were tasteful and appropriate, and the music during the service of the menu very pleasing.

REMARKS OF THE PRESIDENT.

When the coffee and cigars were reached, President McCulloch called for order and said:

Ladies and Gentlemen: The first order of business will be the passage of a resolution of thanks to the ladies of Niagara Falls, for the courtesies and attentions which they have extended to our ladies, and who have made our stay so pleasant, which will make our regrets very great at leaving them. [Applause.] Those in favor of the adoption of the resolution will say aye. [Voices, aye, aye.] Those of a contrary mind will — go over the Falls. [Laughter.]

I am requested to announce that the General Electric Company made all arrangements to illuminate the Rapids to-night, but it is now raining. They will illuminate them to-morrow night, so that anyone who will go there will see something that is worth the trouble. The Rapids will be illuminated to-morrow night, if it does not rain.

Ladies and Gentlemen, This is a green spot in a car driver's life. I would say it was an oasis, but for the unanswerable question—where is the water, which we are told is a component part in the construction of a proper oasis? But we have laid off; and we do not care to-night if every cable

in the land is stranded. It is no concern of ours if all the current ever generated, except that which gives us light, is grounded. [Laughter and applause.] If every trolley is off the wire we will take no heed; we are going to make a night of it. [Applause.] We did not bring any owl-car time cards with us. We are not going to chase the last car; and if we make a miss of it in the morning, and the boss puts us at the foot of the extra list, we don't care a—cent. [Laughter and applause.]

I desire now, seriously, to return my thanks to my friends who crowned me with the honors which I have worn during the past year. All the burdens of my office have been joyful cares; and I have not experienced any part of the saying that "Uneasy lies the head that wears a crown." [Applause.] I wish that my successor may have just as pleasant a rule.

Now, my friends, I am not going to make a speech. I can neither amuse nor instruct you. If I tried to say something funny, you would not laugh; and if I undertook to be serious, you would. [Applause.] Railroad people are not given to talking. [Voices, oh! oh!] We find such discretion in keeping our own counsel that the art perishes from disuse. [Laughter.] Nature is usually fair in the distribution of her gifts, but in this little town of Niagara Falls, which has and is so hospitably entertaining us now, there exists a lucky mortal endowed beyond the ordinary. He is a railroad man of wonderful success and merit; he is a lawyer, and has reached the highest plane in his profession. In the political affairs of his State he is a leader. He is an orator without a peer, and with it all he is a genial host, and when he is out with the boys he is a jolly good fellow. [Applause.] I would be recreant in the performance of my duty in helping to entertain you, if I did not resign the pleasant and delightful duty, that of toastmaster, which is of right mine, into such gifted hands. I do resign now in favor of the man of whom I have spoken, and have the pleasure of introducing him to you in the person of the Hon. W. Caryl Ely, of Niagara Falls. [Great Applause.]

REMARKS OF THE TOASTMASTER.

Mr. President, Ladies and Gentlemen : The eloquent testimony borne by the gentlemen in the rear of the hall, unaccompanied by ladies, is echoed by the fair sex surrounding and about the front of the room. The tribute that you have paid to the worth and ability of Capt. McCulloch is, we all know, well deserved. [Applause.] I think that there must be one or two of Capt. McCulloch's old conductors in the room [applause], and I think that they must have been out late last night. That is no joke, either. The first experience I had with Capt. McCulloch was no joke. He came to Niagara Falls last February, after the Convention had selected Niagara Falls as the place for its next meeting. He came and looked us over in the spring of the year when we came out rather thin and lean, and I guess he thought it was not a very good place to hold the Convention. He took me into a room in the Prospect House and kept me there for about two hours telling him the virtues of Niagara Falls and what we could do as entertainers; but we have one on him now, because he has been forced to announce here to-night that we have done well. However that may be, I can say, as one who has had business to prosecute with Capt. McCulloch as the President of your Association, that he was all the time looking out for the interests of the people whom he had in charge. [Applause.] Although I have never seen the reports of the railroad corporations so fortunate as to be in his care, I will warrant you that the surplus is sufficient to satisfy the directors and the stockholders. [Applause.] You are fortunate, gentlemen, to have had such a presiding officer, and so is Mrs. McCulloch. [Applause.] Although I have never been told who was the person that ruled in that family, I am satisfied, from Capt. McCulloch's good judgment, that it is which and t'other at the family board. [Laughter.]

Gentlemen, in attempting to cater to your mental wishes and wants to-night, we have prepared a list of toasts, and, of course, we at Niagara Falls would put first, as most important, the toast of our city. We are modest in Niagara Falls

[voices, oh! oh!]; I mean everybody in Niagara Falls is modest except the toastmaster. [Laughter.] We have, as the Mayor of our city, a successful business man—a man who is not a politician, but who, in the making of paper, has made his mill and his business celebrated throughout the world, because the products of his mills are furnishing the paper upon which is printed to-day newspapers so far away from us as Constantinople. All I can say about our Mayor is that he is a modest man; but, further than that, I shall say that we elected him Mayor because he was the handsomest man in town. [Applause.] I take great pleasure in introducing to you, to respond to the toast of "Our City," the Hon. Arthur C. Hastings, the Mayor of the city of Niagara Falls. [Applause.]

TOAST—"THE CITY OF NIAGARA FALLS," RESPONDED TO BY MAYOR ARTHUR C. HASTINGS.

MAYOR HASTINGS—Mr. Toastmaster, Ladies and Gentlemen of the American Street Railway Association: Mr. Ely has taken me at a disadvantage. He came to my house two or three days ago, and said that he wanted me to respond to the toast of "Niagara." I come here to-night and find that he is on the programme for Niagara Falls.

THE TOASTMASTER—That I resent, ladies and gentlemen, as an attack upon my reputation for sobriety.

MR. HASTINGS—Mr. Ely, I understand, was out late last night, and I think he is excusable, and probably you will believe me. Under the circumstances, Mr. Ely having misled me as to the toast—I had a very nice speech prepared and am sure you would have enjoyed it—but as the toast is printed differently, I think I will have to leave that speech out, and merely say to you, representing the city of Niagara Falls, that we are delighted to have entertained you. If there was anything in the entertainment that was not just as it should be, you will not attribute it to any unwillingness on our part, but rather to an oversight. We meant to treat you well. We have had you with us now for three days, and we like you; we think you are all right, and would like to have you come again, and trust that you will leave feeling that you can come again, knowing that you will be welcome. We hope to see you all here in '99. Capt. Brinker always puts off any good thing until 1899, when he will have the Pan-American Exposition here, and we shall hope to see you all again in '99. [Applause.]

TOAST—"THE ASSOCIATION," RESPONDED TO BY MR. SMITH P. GALT, OF ST. LOUIS.

THE TOASTMASTER—If I misled the Mayor, I am very thankful that he does not hold the Recorder's Court, as is the case in some cities. If that were the case, I should offer two substitutes for my appearance in court to-morrow morning—I will name them later. They are here now. A guilty conscience needs no accuser, it is said, and I may say to you that both of the gentlemen whom I had in mind, and towards whom I had not directed so much as a glance, are shaking their fingers at me now. [Laughter.] I will have more to do with them later.

The next toast I named myself, because I had some information of the mental calibre and make-up of the gentleman who would be called upon to respond to it. It is entitled "The Association." Now, that does not mean anything. It might mean the American Street Railway Association, or it might mean a baseball club. But the toast was entitled as it is, for the reason that I had been informed that the gentleman who would be called upon to respond to it never associated any ideas in connection with the subject matter of the toast in his remarks. Perhaps, if I were to do it over again, with more especial reference to the gentleman, I would entitle the toast "The Non-Association." I have the pleasure of introducing to you a highly successful, respected and revered counselor of the city of St. Louis, Mr. Smith P. Galt. [Applause.]

MR. GALT—Mr. Toastmaster, Ladies and Gentlemen: I did not know that in Niagara it was necessary for a lawyer to have an endorsement and be introduced as a respectable gentleman. [Laughter.] In St. Louis every lawyer is a respectable gentleman now. We had a few bad ones that left, and I believe they located somewhere in New York State. [Laughter.] Two hundred years ago [voices, oh! oh!]—I see that there are some gentlemen here, among them a past President of the Association, who are afraid of a retrospect. But, as I commenced to say, two hundred years ago [many voices, oh! oh!]—now give me a show—the place where you are now assembled was a howling wilderness, and on this very spot where you are gathered in festive mirth to-night,

the Niagaras, by the banks of the same rapid, rushing, tumbling waters, lighted their camp fires, and around them mingled their war chant with the roar of the cataract's thunder and danced their bloody dance. [Voices, oh! oh!] Do not be frightened, there is no genealogy in that, or ancestoral allusions; but as I was saying, two hundred years ago this place, in which we are assembled, was a howling wilderness, and I wish it was a howling wilderness to-night and I would not be here. [Laughter.] I am scared—I have a stage fright, as it were. I had no idea that I was to face such an audience of beautiful women [applause], and such a wilderness of homely men. [Presentation of bouquets to Mr. Galt by several ladies, amid great laughter and applause, and a voice—"Flowers respectfully declined!"]

THE TOASTMASTER—That's the man! [pointing index finger.]

MR. GALT—But I must go on, and while I admire the magnificent arrangements, always, of your Association, I do sometimes think that at your banquets it would be a good thing to run a live wire into the hall and fasten it to the coat-tails of your speakers, so that, when their power runs a little low, you might, in compassion and kindness, turn on the current and start the motor. [Applause.] I have forgotten what I had prepared to say, and I cannot remember what I ought to say. I wish somebody would start me, like the old man did the boy at the Missouri school exhibition last summer, when everybody was interested in the Turco-Grecian war, and the boy thought that "Marco Bozarris" would be a good thing for a declamation. You all know how it begins; if you don't, look wise, as if you did:—

"It was midnight. In his guarded tent
The Turk lay dreaming of the hour,
When Greece her knee in suppliance bent,
And trembled at his power."

And the boy began, "It was midnight. In his guarded tent, the Turk lay dreaming of the hour, when Greece her knee,—when Greece her knee,—when Greece her knee,"—when an old fellow in the audience roared out—"Jimmy, grease her again, and I think she'll go." [Great laughter.]

On occasions like this I often feel like the soldier whom Sheridan found at Cedar Creek, crouching in a hole, behind the line of battle. Sheridan rode up to him and yelled—"Get up there and get into line; we are about to charge." But the fellow only hugged the hole the closer. And Sheridan put the spurs into his horse and yelled again, "Get up there or I will ride you down." The fellow turned on him with a piteous look and began to cry. Sheridan, disgusted, said, "You're a baby, you're a baby;" and the Dutchman replied, "Yes, General, I know I am a baby, and I vish I vas a gal baby, and den I vouldn't be here." [Laughter.]

But as I am here, and cannot get away, I wish I had been given some other toast. Now, there is "Niagara," or the "Falls of Niagara," but between the Toastmaster and the Mayor they have gotten it mixed up. The Mayor started two nights ago on "Niagara," and then it was the "Falls of Niagara," and now they have it the "City of Niagara on the Falls." But I could not have done that as well as the Mayor—first, because I am not as gifted, and secondly, because I am not as good looking. [Voices, oh! oh!]. This is the only city in the United States where they mingle, and it requires two gifts to be Mayor—one good deeds and the other good looks. [Applause.] In St. Louis and some other cities, we do not necessarily require either. Then there is the toast of "The Wit and Humor of the Bar;" but that would not have suited me either, for

> "I have neither wit, nor words, nor worth,
> Action, nor utterance, nor power of speech,
> To stir men's blood. I only speak right on."

But just wait; you will get it by the "Box" full. [Applause.]

And then comes the evolution or the revolution of Niagara. That would just have been to my taste; for if there is anything in the world that I am, it is metaphysical! But just stay your appetite in this feast of reason and flow of soul, until you get to the "Welch" rarebit. [Applause.]

Gentlemen, it is sad when one must provide foot-notes and marginal references. That was intended for a joke, and you will see the point if you refer to the programme and observe that the "Evolution of Niagara" will be responded to by Mr. Welch! Then comes the "Railroad Commissioners." I could have done that up to my taste in two lines—first, they are not as bad as they might have been, and secondly, are better than we expected, except in Kansas, Missouri and Nebraska. The last toast is "The Technical Press." But there the Toastmaster would have caught me. I do not know what in the world that means, and do not know whether I would be suited for it or not. "Where ignorance is bliss, 'tis folly to be wise."

Nothing was left for me but "The Association," because you do not have the toast of "The Ladies" on the programme. That is the toast of toasts, and, Mr. Toastmaster, you showed your wisdom in omitting it, because that man does not live who could do justice to the subject of "The Ladies." [Applause.] Not until you can find someone who can mingle in himself the attributes of the artist, who can bedeck the lily and adorn the rose, and of the musician who can catch the thrill of the chord of angel's harp, or the tenderness of the mother's lisping prayer, as a child we knelt at her knee, or the agony of that wail of woe, when in the midnight's solemn hour, she lingers still on bended knee in intercession with her God, for that wayward boy who has gone out "on

the hills away, far away from the gates of gold;"—not until you can find some one who can reproduce the tenderness of that touch of love, when, her hands upon your shoulders, as a young man, you went out from the old home into the wide, wide world, without succor or support except the God above you and a mother's benediction;—when you can find some one who can reproduce the smile of your young wife as she turns and looks upon the face of your first born, and sees the invisible angel hand that dimples the little cheeks;—not until you have found one who, in the poverty of the English language, can find the words that will describe the steadfastness of your wife, who, when you first began to lay the foundations of your fame and fortune, helped you with her thrift and industry to win them; and when, in the exigencies of life your fortune took wings and flew away, returned to her habits of thrift without a regret that you could ever see in the joyous smile that each evening welcomed you to your humble home; and with womanly tact, and with more than manly courage held up your hands and heart, while you began the struggle anew;—not until you can find that genius, not yet born, who can compass such a character, let that toast of Woman be announced, because the canvas of the greatest artist, who sought to reproduce the face of Divinity, lies still unfinished on the easel, and mother, wife and daughter, in all their beauty of loveliness and perfection, are God's greatest work in the heavens or upon the earth. [Great applause, and the ladies showered the speaker with flowers and wreaths.]

I was introduced to you as from Missouri. I do not deny it, even in this audience. [Applause.] I am like the old Forty-niner who left Pike County for California, and was not coming back till he had made his millions. Two years afterwards he came trudging across the plains, his only possessions a blind mule, ramshackle wagon, rags and a six-shooter. Passing a town on the frontier an idle crowd inquired,—"Stranger, where are you from?" Drawing his gun, he replied,—"I'm from Missouri; but, by gad, don't you laugh!" [Applause.]

My subject is "The Association," and I had some beautiful bouquets to throw at you, and some timely advice to give you, for even "Out of the mouth of babes cometh wisdom;" but I have been too long on the preamble, and I beg leave to print, which is granted. [Great applause.]

THE TOASTMASTER—When I requested the windows to be opened, I did not mean you to argue from that that I thought Mr. Galt was overcome.

MR. GALT—And I hope that you are not so overcome by Mr. Galt or anything else, that you find it necessary to have some fresh air to revive you. [Applause.]

TOAST—"THE WIT AND HUMOR OF THE BAR," RESPONDED TO BY MR. HENRY W. BOX, OF BUFFALO.

THE TOASTMASTER—Ladies and Gentlemen: I felt quite satisfied that after you had carefully and critically examined the list of toasts you would comment upon the list, because there had been omitted the toast to "The Ladies." I had intended that that toast should appear upon the list, but when Mr. Galt took off his hat to me this morning, I made up my mind I would put him down for "The Association," but he was bound to respond to the toast of "The Ladies." I do not mean that by way of reproach, because if you were behind me and could see the back of my head, you would be able to see that I, like Porter Norton, was in the same Box. [Mrs. Ely presented the Toastmaster with a bouquet.] The lady who presented me with that bouquet is my wife. That is a way she has, usually, of rewarding a poor talk on my part. [Laughter.] The first time I ever made a speech in her presence, she almost broke me up. It was a speech about George Washington, the Father of our Country, and in that speech I made some allusion to the perpetuity of the institutions which he founded. She picked up the manuscript and we went over to the speaking place, and she interpreted it in this way—the perpetuity of the institutions he found dead. As I went along in the speech, from beginning to end, that thing was continually in my mind. The only way I got successfully over it was to send for the sheriff and have the lady removed from the stand—they didn't have a policeman.

There are lawyers and lawyers; some are from Oklahoma and some from Missouri. One of them got away from both places and settled in Buffalo. I do not intend to reproach him by saying that he is from Oklahoma. He must have been from Missouri. I never knew it before until I heard Mr. Galt this evening. And after you have heard the one I am about to introduce you will be ready to swear that they are both from the same town. You know you can tell something about the quality of the current by the way it flashes, and you can always tell the voltage by the brilliancy of the

lights. The generator that has set in motion the voltage of these currents must have been located in the same State, if not in the same town. I have never known Mr. Galt before; but I do know the gentleman I am about to introduce, and I believe, from the remarks of Mr. Galt, that it is an absolute certainty that they must have been born in the same town, and may be they are twins! [Applause.] The next toast is "The Wit and Humor of the Bar." If Mr. Galt intended to take away from Mr. Box his toast, he was doing a mean thing; but that you may be convinced that he did not deprive him of the subject of the toast I shall allow the gentleman to testify. I want to say, however, before he speaks, that the wit and humor that characterizes the next speaker as well as the last, is that of a kindly brilliancy. It flashes from the heart, as well as from the mind, and indicates the possession of a loyal and noble soul. [Applause.] I beg to introduce, as the next speaker, Mr. Henry W. Box, a street railroad lawyer of Buffalo, as the last speaker is a street railroad lawyer from St. Louis, and when you see them both you can never testify that corporations are without souls. [Applause.]

Mr. Box—Mr. Toastmaster, Ladies and Gentlemen:—So good authority as Sidney Smith has said that an excellent and well arranged dinner is a most pleasing occurrence and a great triumph of modern civilized life. I believe it.

It is not only the descending morsel and the excellent wine enveloping it, but the wealth, wit and beauty which surrounds the table. The silent and rapid service of attendants, the delightful remarks, the beautiful and handsomely dressed women—surely the hour of dinner includes everthing which a social and intellectual gratification can desire.

My toast for the evening is "The Wit and Humor of the Bar." The kind of bar has not been defined [laughter], and that I may make no mistake in my remarks this evening I shall consider both. Everybody is, of course, aware of the tortures inflicted upon people at the bar of justice; the popular belief is that no man, however truthful and intelligent, can preserve his consistency under the fire of cross-examination by a skillful lawyer. I have known men, good, conscientious fellows, after tarrying at the bar, who were so tangled up that they could not tell the truth when they reached home and were cross-examined by their wives. It is said that the great wit, Wm. M. Travers, after practicing late at the

bar went home and his wife, aroused from sleep and in a half conscious condition, said: "William, is that you?" And he stammered out, "Yes, whom did you expect?" [Applause and laughter.] Eli Cook, once Mayor of Buffalo, and a very genial and brilliant lawyer, who practiced at both bars very persistently, was once arguing a case before Judge Hoyt during the forenoon. The judge was somewhat crotchety and at various points of the argument ruled against Mr. Cook, and said, "Proceed with any other point that you may have." Court adjourned for noon recess. Mr. Cook spent the time at the other bar, and went to the court house gloriously full. Mr. Cook began to argue all the points over which the Court had ruled upon in the morning. The Court interrupting him, said: "Mr. Cook, we have passed upon these points, proceed to your next." Mr. Cook again started to argue the same points. The judge finally lost all patience and said: "Mr. Cook, sit down, you are drunk." Mr. Cook replied in the most affable manner: "Your Honor is correct, and it is the first correct decision your Honor has made to-day." [Applause.] Old Dr. Johnson said that no man was ever supremely happy except when he was drunk. Dr. Johnson may be right, but if any man here has a remedy that will make a man feel as happy the next day I would like to syndicate it, because there would be millions in it. [Laughter.]

Deafness is a standing excuse for a juror not sitting. If jurors could be excluded who hear only one side in negligence cases the great institution of trial by jury would be abolished. At a dinner recently given in Brooklyn to a retiring judge, a distinguished lawyer, whose business is chiefly confined to defending corporations in negligence cases, responded to the toast, "Trial by Jury." He said, "When I look into the bright faces of the twelve intelligent, conscientious jurors, that are impaneled, sworn to try the case according to evidence, I always know what I am going to get." He said, "recently a judge from South Carolina visited me in Brooklyn and one morning he accompanied me to the courts of law. We remained for some time in one of the courts and listened to the arguments of counsel. The judge on leaving the court said: 'I looked into the faces of that jury and I believe they are utterly incapable of comprehending any of the important questions involved in the suit.' I said: 'You are certainly right, but have you any better system in South Carolina?' 'No,' he said, 'about the same. In a very important case recently before me, the clerk swore the twelve good, true men to try the case. When I said to them, Gentlemen, you will now please take your accustomed seats, nine of them went straight into the prisoners' box.'" [Laughter.] It is a maximum of the law that every man stands equal before the bar, but it is a mere fiction. What rights has any man that a jury will respect with a handsome woman against him? Let a comely and well dressed woman enter the court room and at the first rustle of her silk gown, every man present seems to lose his head. Talk of the equality of the sexes! A man stands no more chance in a lawsuit against a good looking woman, especially if she is a widow, than a

street railroad president does of being saved without repentance [laughter], or being elected to Congress without spending money. The lawyer who should dare to cross-examine such a woman sharply would be considered a brute, and whether party or witness, let her take out a black-bordered handkerchief and put it to her eyes or nose, it makes no difference which, and the jury will treat her antagonist with about as much consideration as the early Christian martyrs received from the wild beasts of Ephesus.

In the rude simplicity of early times a sack of wool was frequently used as a cushion when the judges sat on a hard wooden bench, and the advocate stood behind a rough wooden rail called the bar. I need not describe the character of the other bar as the gentlemen are familiar with it. I noticed quite a number of you gentlemen this afternoon taking observations through a glass concerning the other bar. I only beg to call your attention to the fact that a sack of wool was used and that it has furnished a warrant ever since to lawyers for fleecing their clients and pulling the wool over their eyes. [Laughter.]

Peter the Great, when on his visit to England, declared that he had but two lawyers in his dominions and meant to hang one of them on his return, and Jack Cade's friends said the first thing we do, let's kill the lawyers. The truth is that lawyers cannot flourish except in a free and enlightened country, and their influence and numbers are in proportion to the degree of freedom and enlightenment. New Zealand and China have few lawyers; Prussia only 1,800; France only 12,000; Great Britain, 30,000; and under the government founded on the basis of fair play and absolute equality before the law, we have 40,000 of this incendiary class.

The *New York Times* some time ago had an article on dogs, and commenced by saying that one-half could do all the business, and so with lawyers, one-half could do the business. Some years ago in the adjoining city of Lockport, Mr. A. P. Lanning was one of the counsel in an important case before Justice Barker, and a jury. After recess at noon, the court was kept waiting for a tardy juror, and while waiting a farmer's dog got into the absent juror's seat and curled himself up comfortably. Justice Barker said: "Mr. Lanning, I notice the panel is full. Will you now proceed with the case?" Mr. Lanning hastily got his papers together, adjusted his glasses, and arose to address the jury. He saw the dog, and said, "May it please the court, this fellow (referring to the dog) might make an excellent judge, but I am unwilling to risk him as a juror, besides one Barker in court is enough." [Laughter.]

We live in the most glorious and favored period in the world's history. The world has made more progress in the last sixty years than in any thousand years that have preceded, not only in philosophy, the arts, sciences and mechanical inventions to bless the race,—but in thought, and nowhere have we witnessed a greater change than in what is known as religious thought. Nearly all the old dogmas of the church of fifty years ago are exploded, and consigned to the limbo of the dogs to find

eternal repose; but in a recent trial in England, a very zealously religious judge, addressing the jury in censure of a man who was called as a witness, said: "The man whom the prisoner called to speak for him is, although his evidence could not be received, in reality a witness against him. The man openly avowed his disbelief in the book upon which he was to have been sworn; he told you in fact that he rejected revelation altogether; that he denied the absolute certainty that there is a hell; that he did not credit the existence of a place of perpetual torment; and in short he would deprive us of all the consolations of religion." The wit judicial is not so bad as those make out who would have us believe that the laugh of the court is the laugh of sycophancy. A few months ago Mr. Justin Day, in the Queen's Bench Division, had a case before him of some duration and many technicalities. Towards the conclusion of a long speech, counsel said, and the saying may be taken as a specimen of what had preceded it: "Then, my lord, comes the question of bags; they might have been full bags or half-full bags; or, again, my lord, they may have been empty bags." "Or," interrupted the sorely-tried judge, "they might have been wind-bags." I beg to assure the gentlemen who have preceded me that no reflection is intended. [Laughter and applause.]

John Philpot Curran was one of the most illustrious examples of Irish eloquence, but if his memory is to be held in reverence by posterity it will be chiefly on account of his fearless character. On one occasion he was defending a man on some charge of petit treason, and while opening his case and explaining the law to the jury he noticed that the judge was constantly shaking his head disapprovingly. Mr. Curran could stand it no longer, and he said: "Gentlemen of the jury, I notice that his lordship shakes his head. To the casual observer it would signify that his lordship did not agree with the argument that I am advancing, but I pledge you my honor, gentlemen, before you have been in the court room many days you yourselves will perceive that when his lordship shakes his head there is nothing in it." [Laughter.] I think one of the happiest interventions of an old lawyer in behalf of a young member of the bar occurred in Scotland. The young lawyer had argued a case before the full bench with more zeal than merit, and the court, after hearing him, decided without hearing the other side, against the young man, whereupon he exclaimed: "I am astonished that your lordships could render any such decision." Of course, such a remark was a contempt of court, and the presiding judge ordered him to be committed, when old John Scott, who represented the other side, arose and said: "May it please the court, I beg to interpose a word in the interest of my young friend. He has committed an audacious offence against the dignity of this court, but his youth and inexperience should be considered in his favor. Had the young man one-hundredth part of the experience that I have had in your honor's court, he would not be astonished at any decision which your honor could render." [Applause.]

Lord Erskine has endeared himself to the profession, not so much by his splendid arraignment of Warren Hastings, his wonderfully brilliant speech before Lord Mansfield on the liberty of the press, but by the noble speech he made when brought to the bar for receiving silver instead of gold as a fee, contrary to the universal custom of England. He said: "My lords, I admit that I took silver, but I know I have an excuse that will satisfy any lawyer; I took all that my client had."

And now, my good friends, soon we part. Many of us will never meet again. To such I will not say "good night" but trust that in some better clime I may bid you "good morning." [Great applause.]

TOAST—"THE EVOLUTION OF NIAGARA," RESPONDED TO BY HON. THOMAS V. WELCH.

THE TOASTMASTER—I have not said anything for some minutes. Therefore, the fact that some people are so tired that they are becoming restless, is chargeable to my two legal friends. I never talk anybody to death; but if I wanted to put up two men that could do the job to perfection, I would take one from St. Louis and one from Buffalo. I did not start out to praise all the lawyers in the audience, nor to tell all the women how beautiful they are. All the women who are near me know from the testimony of my glances this evening how much I appreciate their intelligence and their beauty. [Applause.] Here are my friends, H. M. Littell and Tracy Rogers, who do not like me to make remarks of that kind. But all I have to say about the ladies, is, that when the genius of the poets, and the magnificent and beautifully trained minds of the painters—men who lived in planes and spheres of action and of life far removed from those of us who deal with the sordid motives which actuate humanity as we find it from day to day—when upon canvas or in words they pictured the Heavenly Angels, they endowed them with the beauty and attributed to them the souls of women. It is not necessary to go further, and although I had the eloquence of my friend from St. Louis I could not pay a tribute greater to woman than the words I have uttered. [Applause.]

Coming to the mundane utterances of my friend Box, when he speaks of deafness, it makes me think of an incident that took place not many years ago in this State, at Albany,

upon the occasion of the opening of the State Legislature, and the drawing of seats in the lower house of the Legislature, called the Assembly. A gentleman rose and asked that a man from the country should be permitted to have a front seat without drawing for the seat, and said to the people present that he asked the privilege because of the deafness of the member. The gentleman had been a member for a year or two before, and he had become known for certain desires and attributes connected with money, and a base and sordid man from the city said: "Deaf, that fellow deaf, why he could hear a postage stamp drop in a barrel of feathers a block away!" [Laughter.]

Mr. Galt spoke of the evolution of Niagara, and of the revolution of Niagara, and when he uttered the last proposition, I knew him to be possessed of all the ability and discernment accredited to him by his friend, the ex-President of this Association, because if the ladies knew (and it should be told them in secret) after Mr. Welch finishes his remarks, that he was an unmarried man, there would surely be a revolution at Niagara. [Applause.] When he rises to speak, you will notice certain characteristics and certain marked resemblances that were noticed by the clerk in McSweeney's Hotel, a place in New York City where Roman Catholic priests used to be entertained in large numbers. Mr. Welch was a member of the Assembly of the State of New York, and visited New York City as a member of an investigating committee. He went to McSweeney's, and placed his grip upon the counter, and the clerk looked at him and said: "Father, will you be shown now to your room?" [Laughter.] I now take pleasure in introducing to you Hon. Thomas V. Welch, of Niagara Falls, who is familiarly called Father Tom. [Applause.]

MR. WELCH—Mr. Toastmaster and Gentlemen of the American Street Railway Association, Ladies and Gentlemen:—Ten years ago, just after the establishment of the State Reservation at Niagara, while this thriving city was yet a struggling village, before Mr. Schoellkopf's water-power had been developed to its present dimensions, and before the commencement of the hydraulic tunnel which Mr. Adams, Mr. Stetson, Mr. Rankins and their associates have since carried to such magnificent completion, and while the success of the tunnel enterprise

was surrounded with uncertainty, the local incorporators of the tunnel company, whose names have now been forgotten, sent an agent to London to enlist British capital, and after a season their hearts were made glad by the receipt of a cablegram saying that he had induced the Duke of Teck, the Queen's cousin, to assume the presidency of the company, and that the success of his mission was assured. As our previous acquaintance with the British nobility had been confined to the Marquis of Queensbury, the tunnel company naturally felt very complacent, not so much upon obtaining the desired capital, which, by the way, did not materialize, as upon having induced such a shy and modest character as the average British Duke, to enter into such good society. [Laughter.] The anxiety of the Niagara people, for the success of the tunnel enterprise, was well expressed at that time, in a rhyme, that came from Boston—of all places in the world from Boston—to one of our fairest citizens. It had that polish, that peculiar *bean-like polish* that appertains to everything that emanates from the Hub, "the home of culchaw." It ran something like this—

When the Tunnel goes thro'
Won't there be an ado!
Won't the Cataract Town have a boom!
When the Falls all day long,
Will unite in the song,
That resounds from the forge and the loom.
When the Village gives way
To a City, we pray
That the Old Fogies won't look so blue,
What a shake up! Dear me!
Of the Dry Bones we'll see,
When the Tunnel, the Tunnel goes thro'!

When the Tunnel goes thro'
Rustic Neighbor, adieu,
To your Courthouse and Locks evermore
We'll extend our estate,
To the Queen City's gate,
She will meet us half-way on the shore!
And a Boulevard wide,
Will roll on with the tide,
Past the ships at our wharves heaving to,
And we'll have a Race Track,
And a drive out and back,
When the Tunnel, the Tunnel goes thro'!

When the Tunnel goes thro'
Not one City but two,
Will arise where the broad river flows.
One where Commerce will hold

A great struggle for gold,
And the other for joy and repose.
With no traces of men,
Only nature again,
And the deers and the bears in full view.
A metropolis grand!
And a wilderness land!
When the Tunnel, the Tunnel goes thro'!

When the Tunnel goes thro'
Some I know well, don't you?
Who will hail it with rapture galore.
We can't now for our lives
Get seal sacques for our wives,
The nick-nacks which all women adore!
We will then have Chateaux!
And our own Tally-Hos!
And a Yacht and a Green House or two!
If with children we're blessed—
But I'll leave all the rest—
'Till the Tunnel, the Tunnel goes thro'! [Applause.]

Now that may be very bad poetry, even if it did come from Boston. It could not be very much worse if it came from New York, or Philadelphia, St. Louis, San Francisco or New Orleans, or even from Chicago. But from Boston! Shades of Holmes, Lowell, Longfellow and John L. Sullivan, just think of it! [Laughter.]

But it was good prophecy as we will see if we review it for a moment. The tunnel "went thro'" and the power house arose on the upper river. Every night from my home, I see it shining more wonderful than Aladdin's palace. A year ago the electric wires reaching from it, carried the roar of Niagara to New York City, where thousands heard it by telephone, who may never see the great cataract. They carried a peaceful message part way round the world. They are speeding electric cars from Lake Erie to Lake Ontario. They will soon be lighting the streets, warming and lighting the homes, cooking the breakfast and rocking the cradle in Buffalo, Lockport, Rochester, Syracuse, and other of our suburban localities.

The cataract town has had its "boom" and has settled down to business. Many of us are not so handsome as we were before the "boom," but we know more. [Laughter.] If we have any chateaux they are "*Chateaux en Espagne.*" If there are any greenhouses they are the buildings on the State Reservation, because the people here say that I am laboring under an hallucination—perhaps hereditary in my case—that green is the National color, hence all the buildings on the State grounds are painted green. I know of no yachts in this neighborhood,

excepting that of Commodore Connors, and my friend President Ely's private car, which is a sort of a land carrock—but Commodore Connors and President Ely are street railway men—and "of such is the Kingdom of Heaven." I know you would say "Amen" to that proposition. [Applause.]

The Falls already "unite in the song that resounds from the forge and the loom." Our host, Mr. Schoellkopf's, flouring mill makes 600,000 barrels of flour each year. This requires 2,700,000 bushels of wheat, the product of 135,000 acres of land, which would make a farm one mile wide and two hundred and ten miles long; and the Central mill, next door to it, requires another farm just like it, to keep it going. Col. Morgan's mill, the Niagara Falls Paper Mill, will use 50,000 cords of wood a year, the cargo of 130 vessels. It will make 240,000 pounds of paper a day. This would make a sheet of paper two feet wide and 2,400 miles long every twenty-four hours, about one-tenth of the distance around the earth; and the Pettibone Company and the Cliff Paper Company, of his Honor, the Mayor, each hope in time to equal this production.

The electric current here at Niagara is already making more aluminum, carbide for acetylene gas, soda-ash, chloride of potash, pueride of sodium, and diamonds—yes, gentlemen, diamonds of carborundum—than any other place on the face of the globe; and it seems but yesterday that the electric current was set free.

Now let us take another glance at this Bostonian prophecy. We did bid our "Rustic Neighbor" adieu. Our rustic neighbor is Lockport. Many years ago Lockport was the leading town in this county. There are some living *yet*, who remember it. It will occur to your minds at once as the city where the little fat man stole the street railroad, loaded it on freight cars, and got away with it before the inhabitants awoke from their habitual slumbers. I believe he was punished for it, as he deserved. It is one thing to steal a *street*, and another thing to steal a STREET RAILWAY. The latter is an offence against the law, and should be punished; the former is a duty that we owe to our stockholders. [Laughter and applause.]

We did "extend our estate to the Queen City's gate." Buffalo is the "Queen City"—so she says. She met us more than "half way on the shore." She took forcible possession of us. When the tunnel enterprise was hanging in the balance, we invited some of our Buffalo friends down here to help us—Mr. Box, Mr. Bissell, Mr. O'Day, Mr. Urban, and other good fellows. They drank our champagne and smoked our cigars, but did not invest as much money as would grease a gimlet. Now, that the power development at Niagara is a magnificent success, the greatest achievement of its kind of the age, in the expressive language of the day, Buffalo is now "the whole thing." Because of Niagara Power Buffalo is "Greater Buffalo," "The Utopia of the Manufacturer," "The Smokeless City," "The Electric City," "The Power City," "The

Convention City," extending from Lake Erie to Lake Ontario, estimated population in 1920—two millions—populated by electricity! When we read the Buffalo papers we think we must be laboring under a delusion, in thinking that the cataract is just here at the foot of Falls Street. The American Fall is evidently on the Terrace in Buffalo. This would bring the Horseshoe Fall at Ellicott Square, the power house at Music Hall, and the Cave of the Winds, I suppose, in the council chamber in the city hall—that's where we find it at times, here at Niagara. [Laughter.] That would leave *us* nothing but the Devil's Hole to bank on. And all this on 1,000 horse power of an available 200,000 horse power, and an attainable 700,000 horse power! What will be their inflated condition when this fall they receive from us the other 9,000 horse power for which they have contracted? Our friends will readily understand, after having been the handmaid of Buffalo in this fashion, what a relief it is to us, just for a change, to find ourselves, for this occasion, the captive of the American Street Railway Association.

But, after all, Buffalo is a healthy little city. We are associated with her in our business life, in our social life, and in our religious life—for we have religious life here. You must not judge us all by Mr. Ely. We are bound together, not only by the currents of the great river flowing by our doors, but also by the electric current, which unites us in a common destiny. She has given us Mr. Watson, Mr. Littell, Mr. Box, Mr. Fryer, Mr. Urban, Mr. Norton, Mr. Bushnell, Capt. Brinker and the Pan-American Exposition, and for these, as well as for her beauty, enterprise, and good neighborhood, we forgive her for her intrepidity of statement. "With all her faults, we love her still." We are courting her assiduously, and one of these days, we will wed her, we will unite, absorb and annex her to the one Power City, the only Electric City on the continent of America, the city resting on the very brink of the cataract of Niagara. [Applause.]

Just a word, in closing, about the dual city here on the brink of the great cataract, one part for commerce and manufacture, and the other for the pensive contemplation of one of the most sublime works of God! Undoubtedly, the Creator conceived and formed the cataract for the delectation, the purifying, and the uplifting of the minds and hearts of men. The love of the beauty of natural scenery is a characteristic of our modern civilization—one of its most hopeful characteristics. Frederick Low Olmsted says, "There are many passages of natural scenery which, from the effect they produce, may be classed with Niagara among the world's treasures; yet none of them have long been highly valued by any one. A few centuries ago, that is to say, people, even the advanced lines of civilized progress, seem to have taken no pleasure in them. But a change has since been gradually occurring. It was already well marked among the educated classes of the last century. In the present it has advanced rapidly with the main body of people of all advancing countries. As far as our own is concerned, no better evidence

could be wanted of such an advance than is to be had by considering the legislation that has established the duties of your Commission, and the manner in which this legislation was brought about, in connection with the fact that when in 1806 the State sold the property which it has lately re-acquired at Niagara, it is not known that a single one of all its people thought of it as having even a prospective value otherwise than a mill power." So tender and sympathetic has that love become that in response to it, the Empire State of New York tore down the barriers and removed the disfigurements that had been placed here, and made Niagara free to all mankind. No other act so reflects the culture and enlightenment of the people of the Empire State. [Great applause.] The Power of Niagara was also surely placed here by the Creator for some wise purpose, to be utilized in His own good time. The development of electrical science showed that the time was at hand, and as if part of a Divine plan, the utilization of Niagara followed almost immediately upon its preservation; the legislation for the one being completed in 1885, and that for the other introduced in 1886. So closely did they follow each other that they were united in one man, a townsman of Mr. Stedman's, Thomas Emshed, of Rochester, who, while making the map, under which the State took the lands, conceived the idea of the great hydraulic tunnel, which he did not live to see inaugurated. Thus, they seem designed to go hand in hand forever. Some there are who fear they are antagonistic, that in the end, beauty will be sacrificed on the altar of utility, by the ever increasing diversion of the water, which forms the beauty of the scenery.

But in my mind there arises another and a more imminent danger, that in time the custodians may lose sight of the main object of the State in reserving these shores, the pensive enjoyment of the beauty of the natural scenery, and that in order to attract crowds for other objects, it may be made a place of amusement, that the rope-walker, the mountebank, the hurdy-gurdy and the merry-go-round may, in time, turn these banks into a Bowery, a Coney Island or a Midway Plaisance; that attempts may be made to gardenize these slopes in the grotesque and fantastic shapes found in city parks and at other places of public resort; that they may seek to embellish the scene into glaring structures and artificialties. Any one with the true feeling—

> "One who in the love of nature
> Holds communion with her visible forms,"

realizes, that a formation, a statue, a work of art however beautiful or desirable elsewhere, the petty creature of the hand of man, would be out of place here set up in rivalry with this great work of God, by common consent the most sublime thing in nature. [Great applause.] That to attract the multitudes for ends foreign to the object of the State, cheap theatrical effects and colored lights may be introduced. In the mind of the great bard, this indeed would be—

"To gild refined gold, to paint the lily,
To throw a perfume on the violet,
To smooth the ice, or add another hue
Unto the rainbow, or with tapers light
To seek the beauteous eye of heaven to garnish." [Applause.]

Andrew H. Green struck the key note of the great composition: "Keep close to nature, in this domain which is, and is to be, the resort of all peoples. Its chief attractions are those beyond human control!" None realize this more than the busy men I see before me, the members of the American Street Railway Association, for none apply themselves more closely to their work in the crowded cities, and when the summer comes they long to get away to gaze in the great calm face of nature,—they

"Close their eyes in their garnished rooms
To dream of meadows and clover blooms."

Let them come and stand upon these shores and "gaze upon the appalling and tremendous volumes of the speeding current," truly

"A river no longer but a sea unrivalled!"

Let them stand upon the brink where Father Hennepin first saw "a vast and prodigious cadence of nature, insomuch that the universe does not afford its parallel!" Let them traverse the great gorge and they must feel, that if Shakespeare were gifted with prophecy he had it in mind, when he said—

"For do but stand upon the foaming shore
The chiding billow seems to pelt the clouds!"—

or, looking above them—

"There is a cliff whose high and bending head
Looks fearfully in the confined deep"—

Or let them stand before the Horseshoe Falls and say with Dickens—"It was not until I came on Table Rock and looked—Great Heaven, on what a fall of bright green water!—that it came upon me in its full might and majesty.

"Then when I felt how near to my Creator I was standing, the first effect, and the enduring one—instant and lasting—was peace, peace of mind, tranquility, calm recollections of the dead, great thoughts of eternal rest and happiness, nothing of gloom or terror. Niagara was at once stamped upon my heart, an image of beauty; to remain there, changeless and indelible, until its pulses cease to beat, forever." [Applause.]

Such, ladies and gentlemen, is the message of Niagara to the heart of man. So may it sink into it—

"While the rapids tumble down
And the islands are in view
And rainbows bend in splendor to the shore."

[Great applause.]

Mr. Stedman, Rochester—I have the permission of the Toastmaster to ask you to give three cheers for Mr. Welch, the man to whose ambition, energy and perseverance we are indebted, and whose indefatigable labor has secured to the American people through all generations this magnificent Park of Niagara.

Three hearty cheers were given.

TOAST—"THE RAILROAD COMMISSIONERS," TO HAVE BEEN RESPONDED TO BY HON. ASHLEY W. COLE, OF ALBANY.

The Toastmaster—Ladies and Gentlemen: You have, undoubtedly, formed some idea of the mental make-up and capacity of my friend, who has been correctly described as the man who got the Park, but you do not know all about him, in the light of the estimation of a fellow-countryman of his. When we were together in the Legislature of '83, Mr. Welch, although a Democrat, was much given to voting as he pleased. He sometimes cast his vote with the Democrats and sometimes with the Republicans. A fellow-countryman of his, named Patrick Henry Burns, whose memory we revere, was inveighing loudly one day against Mr. Welch to a group of their fellow-countrymen, whereat a gentleman standing nigh said: "What's the matter with Welch; he's an Irishman, is he not?" He replied: "Yes, be jabbers, but he came to the country by the way of Boston." [Laughter.] Mr. Welch, however, has that culture of mind which enables him to talk for an hour or two without more than once referring unkindly to his English neighbors, which reminds me of an incident related once by a mutual friend of his and mine, Judge Fitzgerald, who presided with great ability at a meeting called to sympathize with the Irish Land League. At that meeting Mr. Fitzgerald presided most gracefully, and made a beautiful and flowery speech; but after the speech was ended a small, weazened, dried-up specimen of the Milesian race arose in the back part of the hall and said: "Mr. Chairman, too long Ireland has fought England with poetry and flowers; what Ireland wants is less

blatherskite and more dynamite." [Laughter.] But, when I tell the story, I draw no invidious comparisons.

It is with regret that I announce that Col. Ashley W. Cole, the gifted and able Chairman of the Railroad Commissioners of the State of New York, has been forced to send his regrets. The communication is addressed to Capt. McCulloch, but I will, with his permission, read it.

NIAGARA FALLS, October 21, 1897.

CAPTAIN ROBERT MCCULLOCH,

PRESIDENT, AMERICAN STREET RAILWAY ASSOCIATION.

Dear Sir:—I very much regret that an urgent and unexpected matter of official business requiring my attendance at Albany, precludes me from the pleasure of being present at the banquet of the American Street Railway Association, and of responding to the toast which had been reserved for some remarks on the subject of Street Railways and the Railway Commission.

The opportunity, however, exists for me to say in this more formal way, that the representatives of the New York State Commission who have attended this Convention and Exposition, have been deeply interested in the transactions of the Association, and in the exhibition of street railway mechanism and appliances, which has been here gathered under its auspices.

All such meetings and displays of progress in the form of enterprise with which you are all identified, exercise a most salutary influence upon the problem of local transportation service, and tend to elevate and dignify the calling of every man engaged in it, whether he be a high officer in the company or a practical mechanic in its service.

The New York State Railroad Commission has an intimate official relation to the street railways of the Empire State, and it gives me pleasure to believe that the managing minds of those great interests feel confidence in the integrity of the Commission, and concur in the legislative and executive wisdom which created and maintains this form of governmental recognition and reasonable control of the service. We feel assured that no fairly administered existing corporation, and no projected legitimate enterprise in street railroading in this State, mistrusts or fears the exercise of the large powers which the State has placed in our hands. With such a mutually conservative and honest feeling and relation, the best interests of the corporations and the people are readily recognized, and adjusted more promptly and satisfactorily than could be the case without such official scrutiny and interpretation.

Very truly yours,

ASHLEY W. COLE.

THE TOASTMASTER — Upon the expression of just such sentiments as these, coming from just such men, I base my proposition, in which I absolutely believe, that the only escape from municipal ownership is in governmental control. [Applause.]

TOAST—"THE TECHNICAL PRESS," RESPONDED TO BY MR. H. H. WINDSOR, OF CHICAGO.

THE TOASTMASTER — Now, the next toast, and the last, that of "The Technical Press," I interpret somewhat differently from my friend from St. Louis. But why the gentleman whose name is printed opposite the toast should have been selected to respond to the toast, I know not, and the President must answer, because I am told that the gentleman comes from Chicago. [Laughter.] The Technical Press, as I interpret it, means the Press which has to do with the technique of electric street railroading. Now, then, if I should ask anyone what a man in Chicago knew about, I should expect that he would answer, "Why, wind-sir!" [Laughter and applause, and cries of "Oh! oh!"] It gives me pleasure to introduce our friend, Mr. Henry H. Windsor, of the *Street Railway Review*, Chicago. [Applause.]

MR. WINDSOR—Mr. Toastmaster, Ladies and Gentlemen:—We came here last evening and the time has passed so pleasantly and rapidly, that it is now to-morrow morning; and the edition we prepared for last evening, will now be issued as a supplement.

If the shoemaker should stick to his last, the editor might with equal reason, be expected to stick to his editing, and satisfied with addressing his readers once each month, give some one else a chance, and not be always bobbing up at banquets and other pleasant places.

No other agency, not even the pulpit or the public school, has so largely to do with the life and welfare of the American people, and the development of our modern civilization, as the press. Of this 19th century giant a great jurist said the other day:

"The modern journal is a new John, a voice in the wilderness crying the coming of a larger civilization, telling of the better men and women that are to be, telling of the advance in those things which will broaden the thoughts and soften the hearts of men."

The locomotive is a good simile by which to illustrate the power of the press. It can carry mighty burdens; it can distance the swiftest bird; when it is pushed across continents it changes the channels of

trade, and makes new stations for commerce; when it is driven into the wilderness, savage beasts and savage men alike retire from it, and civilization with unsoiled sandals follows in its trail.

What the daily press is to the community at large, the technical press is, in its special field.

During the past few days we have stood upon the brink of a mighty chasm, where Nature in the patience of ages has cut herself a pathway through the solid rocks; her drill the countless drops of water each in itself no larger than the tear upon an infant's face. And this great gulf seems to separate us from another world; an unseen, unknown past; and as we compare these hoary decades of centuries long gone by, with the history-making epoch of the past decade, the contrast appeals to us as it never did before.

Ever since the dawn of history great events have been compassed within the limits of a single decade. In ten years Cæsar rose to be a dictator and fought and won the battles which made Rome the mistress of the world. For ten long years the Romans trembled at the very name of Nero, the last of the Cæsars; in ten years Napoleon rose from the rank of captain to the head of the European confederacy and won the title of King of Kings; for ten years more he ruled Europe with a rod of steel dipped in blood, and in those passing years we read the story of Spanish Castles laid in dust; of the fierce fight of Austerlitz; we see the northern skies reflect the light of burning Moscow, like a great aurora borealis, the memorable one hundred days; the battle of Waterloo; the banishment to St. Helena. But as we hold aloft the light of nineteenth century progress, and peer back into those dark and gloomy depths, cut like deep grooves into the path of history, we cannot but feel that our last decade, a decade in which has been worked out a bloodless conquest, and a peaceful revolution, is better than them all. It would seem as if the gathered forces and riches of science, and art, and education, had all poured into the lap of the past decade their choicest treasures, and of all the advances which have come to men, none has done so much, for so many, as the great change in city transportation. [Great applause.]

Only one decade since, we were like a great people in bondage looking for relief, but not knowing whether it would come from the sky above or the earth beneath. It has come to us from both. It was then that a little feeble light flickered from across the dark waters of our uncertainty. It was whispered that relief was near; but the storm raged fiercely and more than once the little craft seemed swallowed in the foaming billows; but on and on it came; all eyes were strained to watch its progress; wave after wave of difficulty was overcome; even the undertow of prejudice, a prejudice as stubborn as that which kindled witch-fires in New England, dashed itself into harmless foam upon the rocks of merit. At last it reached the shore and the electric car has conquered. [Applause.]

As we look back to-night, that little spark has become a mighty sun, whose genial light not only fills our own land, but is reflected from these shores to Britain; from there, to France and Germany; down into Italy; across the Mediterranean where at this moment in old Egypt, the sleepy Sphynx awakes to watch the trolley cars, and hear the warning bells in the streets of Cairo. In Cape Town, in Madras, in Japan, back to British Columbia, again in our own fair land; the world has been encircled; this new force has possessed the earth.

In this conquest electricity has swept away thousands of horses like an epidemic; corn has been replaced by coal; the empty stalls are now occupied by horseless cars; and the smoke pouring from a thousand stacks is a veritable cloud by day and pillar of fire by night, which marks the spot where a modern creation is being wrought. A creation which the school boy can explain; a creation which the strongest mind has never dared to fathom or been able to grasp. [Applause.]

In all this progress your technical press has served you well; it has gathered information from every possible source; it has employed men to work out hard problems; it has encouraged where difficulties seemed to have overcome; it has raised a warning cry of danger there; in all modesty but in all fairness, I can say, no other field is better served by its technical press, than is yours. [Applause.]

And it reaches everywhere. From the northern limits, where the snow king is even now putting on his mantle of white, to the sunny south where summer still adorns herself with flowers; from the Atlantic shores with its countless industries, all through the broad domain stretching to the far west, to where the fair Sierras reign in state, at this moment their lofty snow-capped tops reflecting a dream of gold and crimson snatched from this day's dying sun. [Great applause.]

THE TOASTMASTER—Gentlemen of the Association:—The successful issue of this Convention is due to one thing more than to any other, and that is to the painstaking, untiring, faithful work of the Secretary of the Association. [Applause.] I shall not call upon him to make a speech, because I heard in Chicago that he never made one in his life; but I ask you to drink with me to the health of our Secretary and Treasurer, Mr. T. C. Penington, and the gentleman may show himself.

[The company drank to the health of Mr. Penington.]

MR. PENINGTON—Let me say a word.

THE TOASTMASTER—Why! he will say a word!

MR. PENINGTON—Mr. Toastmaster, Ladies and Gentlemen:—Mr. Ely has told two truths. He said, first, that I

could not make a speech; and that is one truth. I have been to the Falls twice before this year. I came here the first time for five thousand extra feet of space in the Exhibit Hall. I got it. I came here a second time, and got five thousand feet more. At that time Mr. Ely told me if I came here again he would get even with me. He has got even with me now; and that is the second truth.

THE TOASTMASTER—Getting a speech out of Penington is like finding a needle in a hay stack.

The banquet then came to a close; and the festivities were continued in the ball room.

REPORT OF THE COMMITTEE ON MEMORIALS OF DECEASED MEMBERS.

Messrs. Dyer, of Augusta, Ga., and Smith, of Troy, N. Y., appointed by President McCulloch as a Committee on Memorials of Deceased Members, have filed the following obituary notices with the Secretary.

COL. WILLIAM HENRY SINCLAIR.

Col. William Henry Sinclair, of Galveston, Texas, died in Rochester, N. Y., of apoplexy, January 11, 1897. Col. Sinclair's first connection with street railway interests began at Galveston in 1876, when he became a stockholder in the Galveston City Railroad Company. He was elected President of that Company in 1879, and held the position continuously until 1896. He was also President of the Houston City Street Railway Company, of Houston, Texas, for a number of years. He was one of the pioneers in electric lighting in Texas. He purchased the first electric light generator used in that State, a 12-arc light generator for lighting the beach pavilion. His faith in the future of electric lighting caused him to organize the Brush Electric Light and Power Company, of Galveston, and he kept abreast of the advance of electric lighting and electric traction afterwards. He attended nearly every meeting of the American Street Railway Association, both of the above

street railway companies being members. He was second vice-president of the Association in 1886-7. He had been intimately associated with the growth and progress of Galveston, and his death was considered a public loss, as he possessed unusual executive ability and qualifications for organizing, and was enterprising to a fault.

Col. Sinclair was born in Akron, Ohio, October 31, 1839; educated in the public schools of Michigan, his parents residing at Jonesville. At the age of twenty-one he entered the Federal army, enlisting as a private in Company C., Seventh Michigan Infantry; appointed Sixth Corporal in the same Company July 6, 1861; promoted to Sergeant-Major August 12, 1861; appointed Aide-de-Camp on staff of Brigadier-General Stanley (now Major-General) May 10, 1862; appointed First Lieutenant, Third Michigan Battery, July 15, 1862; appointed Captain and Assistant Adjutant-General on staff of Brigadier-General Stanley September 5, 1862; appointed Major and Assistant Adjutant-General of Volunteers to date from May 8, and commissioned Colonel by brevet dated from March 13, 1865.

He was engaged in the following sieges, skirmishes and battles of the Civil War:

Siege of New Madrid and Island No. 10, March and April, 1862.

Siege of Corinth, May, 1862.

Battle of Iuka, September 19, 1862.

Battle of Corinth, October 3 and 4, 1862.

Battle of Stone River at Murfreesboro, Tenn., in December and January, 1862-3.

At the close of the war he was ordered with his army corps to Texas and there fulfilled positions of honor and influence up to the date of his muster out, which was in 1867. He was so well pleased with the State that he decided to make Galveston his future home, which intention was fully carried out.

He was elected a member of the Twelfth Legislature of Texas and was chosen Speaker of the House. He was appointed Collector of Internal Revenue May 1, 1873, and continued to hold the position until the inauguration of President Cleveland.

He was Postmaster of Galveston under President Harrison's administration.

Mrs. Sinclair died in the summer of 1895, and soon after Col. Sinclair severed his connection with the railway company. He still continued to take an interest in street railway affairs, and at the time of his death had a railway project under consideration. He was a prominent Mason, a member of the Grand Army of the Republic, and also of the Loyal Legion Army of the Cumberland.

ALBERT MERRITT BILLINGS.

Albert Merritt Billings was born in Royalton, Vermont, April 19, 1814. Educated in the common schools of Vermont and New Hampshire, he early showed such superior qualities as to attract public notice, and at the age of twenty-two was elected Sheriff of Sullivan County, N. H., which position he filled for some thirteen years.

Like many another of the old school railway magnates, his first experience in passenger traffic was with a stage-coach line. This line, of which he was owner and manager, ran between Boston and Concord, N. H., but as the stage coaches gave way to railroads, he naturally turned in that direction and after a few years spent at Saratoga went West, where, in 1857, he became interested in the Prairie Du Chien, now the Chicago, Milwaukee and St. Paul Railroad.

In 1859 he went to Chicago with C. K. Garrison of New York, and together they built and assumed control of the People's Gas Light and Coke Company, of Chicago, which control was retained until 1887, Mr. Billings being President of the Company.

He was also interested in building and operating the Third Avenue Elevated Railroad in New York City. He was also interested in the New York and Northern Railroad, and the Missouri Pacific Railroad; also the St. Louis, Fort Scott and Kansas City Railroads, his Missouri Pacific interests being finally purchased by Jay Gould.

Mr. Billings was one of the original incorporators of the Home National Bank, of Chicago, which was incorporated in 1872. He was also interested in the Home Savings Bank, of Chicago, and eventually owned a controlling interest in both of these banks, and at the time of his decease was President of both.

As illustrating his faith and interest in Chicago and his resources as a banker, it is related of him that, during the panic of 1893, when the Chicago banks needed money to carry them through the storm, Mr. Billings drew $4,000,000 from his funds in New York and placed it at their disposal. In 1886 Mr. Billings was interested in the building of the St. Louis, Kansas City and Colorado Railroad, which was afterwards purchased by the Sante Fe Railroad.

In 1890 he became interested in the Citizens' Street Railroad Company, of Memphis, Tenn. This road he equipped with electricity and enlarged and extended till it absorbed all the street railway lines of that city, and by his constant improvements had become at the time of his death one of the leading street railway systems of the South.

Mr. Billings died on Sunday evening, February 7, 1897, lacking about two months of being eighty-three years old.

JOHN RADEL.

John Radel, Vice President of the Brunswick Traction Company, New Brunswick, N. J., died at his home in Newark, May 9, 1897. He had been ill for some time with heart trouble. He was seventy-four years old.

Mr. Radel was born in Bavaria and came to this country as a youth, obtaining his first employment in a bakery in Newark at three dollars a month. Next he carried on a small bakery for several years, but sold it and embarked in the coal business, leaving that to start a grocery.

He bought the Newark and South Orange Horse Railroad and within ten years was making over forty per cent. on his investment. Two of his elder sons worked for him in the office and on the road, and the business was kept strictly in the family for seventeen years, when Mr. Radel sold the road for $1,500,000, two-thirds of which he took in the four per cent. bonds of the new company. Then he retired from active business and was not well afterward.

Mr. Radel was married three times and was the father of eleven children, ten of whom are living. His eldest son, Andrew, is the President of the Bridgeport Traction Company, and Edward, the next, is Superintendent of the Brunswick Traction Company.

The employees of the Brunswick Traction Company passed resolutions of condolence upon the death of Mr. Radel and said that he was "Just in all his dealings, giving to every man his rightful due; his was also the generous hand, the kindly hand in times of affliction and sorrow. His life, a constant struggle against adverse conditions, crowned by the most glorious success, affords a splendid example of what may be accomplished by energy, honesty and unwearying perseverance."

SPECIAL COMMITTEES, 1898.

Special Committees to submit papers at the next meeting will be appointed during the year by the Executive Committee.

NEXT REGULAR MEETING.

The Seventeenth Regular (Annual) Meeting will be held in Boston, Mass., in the autumn of 1898.

CONSTITUTION AND BY-LAWS OF THE AMERICAN STREET RAILWAY ASSOCIATION.

CONSTITUTION.

NAME.

I. The name of the Association shall be "The American Street Railway Association," and its office shall be at the place where the Secretary resides.

OBJECT.

II. The object of this Association shall be the acquisition of experimental, statistical and scientific knowledge, relating to the construction, equipment and operation of street railways, and the diffusion of this knowledge among the members of this Association, with the view of increasing the accommodation of passengers, improving the service and reducing its cost; the establishment and maintenance of a spirit of fraternity among the members of the Association by social intercourse, and the encouragement of cordial and friendly relations between the roads and the public.

MEMBERS.

III. The members of this Association shall consist of American Street Railway Companies, or lessees, or individual owners of street railways; and each member shall be entitled to one vote by a delegation presenting proper credentials.

AMENDMENT.

IV. This Constitution may be amended by a two-thirds vote of the members present at a regular meeting, after the proposed amendment shall have been submitted, in writing, at the preceding regular meeting and a copy sent to each of the members.

BY-LAWS.

APPLICANTS.

I. Every applicant for membership shall signify the same, in writing, to the Secretary, enclosing the requisite fee, and shall sign the Constitution and By-Laws.

OFFICERS AND EXECUTIVE COMMITTEE.

II. The Officers shall consist of a President, three Vice-Presidents, and five others, who shall constitute the Executive Committee, and a

Secretary and Treasurer. The Executive Committee shall have the entire charge and management of the affairs of the Association. The Officers and Executive Committee shall be elected by ballot, at each regular meeting of the Association, and shall hold office until their successors shall be elected. The duties of Secretary and Treasurer shall be performed by the same person. The Secretary and Treasurer shall not be a member of the Executive Committee.

DUTIES OF OFFICERS.

III. The officers of the Association shall assume their duties immediately after the close of the meeting at which they are elected; they shall hold meetings at the call of the President, or, in his absence, at the call of the Vice-Presidents, in their order, and make arrangements for carrying out the objects of the Association.

PRESIDENT.

IV. The President, if present, or in his absence, one of the Vice-Presidents, in their order, if present, shall preside at all meetings of the Association and of the Executive Committee.

TREASURER.

V. The duties of the Treasurer shall be to receive and safely keep all moneys of the Association; to keep correct accounts of the same, and pay all bills approved by the President; and he shall make an annual report to be submitted to the Association. He shall give a bond to the President in such sum, and with such sureties, as shall be approved by the Executive Committee.

SECRETARY.

VI. The duties of the Secretary shall be to take minutes of all proceedings of the Association and of the Executive Committee and enter them in proper books for the purpose. He shall conduct the correspondence of the Association, read minutes and notices of all meetings, and also papers and communications, if the authors wish it, and perform whatever duties may be required in the Constitution and By-Laws appertaining to his department. He shall be paid a salary, to be fixed by the Executive Committee.

MEETINGS.

VII. The regular meeting of the Association shall be held at such time between the fifteenth day of September and the fifteenth day of December, in each year, as the Executive Committee may decide to be best suited to the locality in which the meeting is to be held; the time to be decided on and each member of the Association notified of the selection by the first day of March in the year in which the meeting is to be held. Special meetings may be held upon the order of the Executive Committee. Notice of every meeting shall be given by the Secretary, in a circular addressed to each member, at least thirty days before the time of meeting. Fifteen members shall constitute a quorum of any meeting.

ORDER OF BUSINESS. (1.)

VIII. At the regular meeting of the Association the order of business shall be :

1. The reading of the minutes of the last meeting.
2. The address of the President.
3. The report of the Executive Committee on the management of the Association during the previous year.
4. The report of the Treasurer.
5. Reports of Special Committees.
6. The election of Officers.
7. The reading and discussion of papers of which notice has been given to the Secretary, at least thirty days prior to the meeting.
8. General business.

ORDER OF BUSINESS. (2.)

IX. At other general meetings of the Association, the order of business shall be the same, except as to the 3d, 4th and 6th clauses.

NOTICES.

X. The Secretary shall send notices to all members of the Association at least thirty days before each meeting, mentioning the papers to be read and any special business to be brought before the meeting.

EXECUTIVE COMMITTEE.

XI The Executive Committee shall meet one hour before each meeting of the Association; and on other occasions when the President shall deem it necessary, upon such reasonable notice, specifying the business to be attended to, as the Committee shall, by vote, determine.

VOTING.

XII. All votes, except as herein otherwise provided, shall be *viva voce;* and in case of a tie, the presiding officer may vote.

NON-MEMBERS.

XIII. Any member, with the concurrence of the presiding officer, may admit a friend to each meeting of the Association; but such person shall not take any part in the discussion, unless permitted by the meeting.

READING OF PAPERS.

XIV. All papers read at the meetings of the Association must relate to matters connected with the objects of the Association, and must be approved by the Executive Committee before being read, unless notice of the same shall have been previously given to the Secretary, as hereinbefore provided.

PAPERS, DRAWINGS AND MODELS.

XV. All papers, drawings and models submitted to the meeting of the Association shall remain the property of the owners, subject, however, to be retained by the Executive Committee for examination and use, but at the owner's risk.

FEES.

XVI. Members shall pay an admission fee of twenty-five dollars, and annual dues of twenty-five dollars, payable in advance. The Executive Committee shall have no power to expend, for any purpose whatever, an amount exceeding that received, as hereinbefore provided for. It shall be the duty of the members to make such returns to the Secretary as shall be required by the Executive Committee.

ARREARS.

XVII. No member whose annual payment shall be in arrears shall be entitled to vote.

WITHDRAWAL.

XVIII. Any member may retire from membership by giving written notice to that effect to the Secretary, and the payment of all annual dues to that date, but shall remain a member, and liable to the payment of annual dues until such payments are made, except as hereinafter provided.

EXPULSION.

XIX. A member may be expelled from the Association by ballot of two-thirds of the members voting at any regular meeting of the Association, upon the written recommendation of the Executive Committee.

RULES OF ORDER.

XX. All rules not provided for in these By-Laws shall be those found in Roberts' Rules of Order.

AMENDMENT.

XXI. All propositions for adding to or altering any of these By-Laws shall be laid before the Executive Committee, which shall bring them before the next regular meeting of the Association, if it shall think fit; and it shall be the duty of the Committee to do so, on the request, in writing, of any five members of the Association.

COPIES OF CONSTITUTION AND BY-LAWS.

XXII. Each member of the Association shall be furnished by the Secretary with a copy of the Constitution and By-Laws of the Association, and also a list of the members.

LIST OF MEMBERS

AND THEIR OFFICERS,

NOVEMBER FIRST, 1897.

(Arranged Alphabetically According to Cities.)

Note.—"Clerk," as used in the following list, is equivalent to "Secretary"—this being a custom peculiar to the Eastern States.

Akron, O., Akron St. Ry. and Illuminating Co.

Pres., Samuel Thomas; Vice-Pres., E. C. Gibson; Sec., J. A. Long; Treas., J. B. Clewes; Gen. Man., W. D. Chapman; Supt., Charles Hardesty; Elec., P. J. Boucher.

Allentown, Pa., Allentown and Lehigh Valley Traction Co.

Pres., Albert L. Johnson; Sec. and Treas., A. F. Walter; Supt., James Uhl.

Alton, Ill., Alton Ry. and Illuminating Co.

Pres. and Treas., Joseph F. Porter; Vice-Pres., James Duncan; Sec., H. S. Baker, Jr.; Chief Eng. and Master Mech., James T. King; Supt. Lighting, J. H. Hopkins.

Anderson, Ind., Union Traction Co.

Pres., Philip Matter; Vice-Pres., J. A. Van Osdol; Sec., Ellis C. Carpenter; Treas., John L. Forkner; Gen. Man., Chas. L. Henry; Elec., Charles Berry.

Atchison, Kan., Atchison Ry., Light and Power Co.

Pres., R. L. Pease; Vice-Pres., W. P. Waggener; Sec., J. W. Orr; Treas., C. S. Hetherinton; Gen. Supt. and Man., J. A. Bendure; Aud., F. W. Downs.

Atlanta, Ga., Atlanta Consolidated St. Ry. Co.

Pres., Joel Hurt; Vice-Pres. and Gen. Man., Ernest Woodruff; Sec., T. K. Glenn; Treas., R. J. Lowry; Aud., A. J. Chapman; Supt., H. N. Hurt; Elec. Eng., N. W. L. Brown.

Atlanta, Ga., Atlanta Ry. Co.

Pres., M. F. Amorous; Vice-Pres., Jacob Haas; Sec. and Treas., S. H. Bennett; Supt., Pur. Agent and Elec., F. M. Zimmerman.

Augusta, Ga., Augusta Ry. and Electric Co.

Pres., Daniel B. Dyer; Vice-Pres., Roland R. Conklin; Sec. and Treas. Charles B. Reavis; Gen. Supt. and Elec., William E. Moore.

Baltimore, Md., Baltimore City Passenger Ry. Co.

Pres., Walter S. Franklin; Sec., Henry P. Smith; Treas., A. B. Clark; Gen. Man., F. L. Hart; Elec., J. H. Gibson.

Baltimore, Md., Baltimore Consolidated Ry. Co.

Pres., Nelson Perin; Vice-Pres. and Gen. Man., William A. House; Sec., Thomas C. Jenkins; Treas., Frank S. Hambleton; Aud., H. C. McJilton; Elec., Thomas A. Cross.

Battle Creek, Mich., Michigan Traction Co.

Pres. and Gen. Man., Loren N. Downs; Vice-Pres., E. Hope Norton; Sec., Dee Allen; Treas., Charles A. Stover; Supts., F. I. Griswold and W. D. Hawley.

Bay City, Mich., Bay Cities Consolidated Ry. Co.

Pres., William B. McKinley; Vice-Pres., Richard S. Hunter; Sec., C. C. Rush; Treas., H. H. Worrington; Gen. Man., Samuel L. Nelson; Asst. Gen. Man., W. R. Morrison; Supt. and Elec., R. S. Ashe.

Binghamton, N. Y., Binghamton R. R. Co.

Pres., G. Tracy Rogers; Vice-Pres., J. B. Lanfield; Sec., J. M. Johnson; Treas., J. B. Rogers; Gen. Man. and Purch. Agt., J. P. E. Clark; Elec., C. D. Brown.

Birmingham, Ala., Birmingham Ry. and Elec. Co.

Pres., A. M. Shook; 1st Vice-Pres. and Gen. Man., Robert Jemison; 2d Vice-Pres., William A. Walker; Sec. and Treas., James A. Stratton; Supt., John B. McClary; Elec. Supt., George H. Harris.

Boston, Mass., West End St. Ry. Co.

Pres., Samuel Little; Vice-Pres. and Clerk, Prentiss Cummings; Treas., Joseph H. Goodspeed; Gen. Man., Charles S. Sergeant; Gen. Supt., Julius E. Rugg; Aud., Henry L. Wilson; Elec., R. W. Conant; Mast. Mech., C. F. Baker; Eng. of Line, Charles H. Hile; Roadmaster, R. Hapgood; Civil Eng., A. L. Plimpton; Purch. Agent, H. F. Woods.

Bridgeport, Conn., Bridgeport Traction Co.

Pres. and Gen. Man., Andrew Radel; Vice-Pres., Henry M. Doremus; Sec., Thomas L. Watson; Treas., William Scheerer; Aud., E. D. Hinman; Elec., F. E. Fischer.

Brockton, Mass., Brockton St. Ry. Co.

Pres., George H. Campbell; Clerk, Alfred A. Glasier; Treas., G. E. Tripp; Gen. Man., Horace B. Rogers; Asst. Clerk, W. F. Pope; Asst. Treas., Henry E. Reynolds.

Brooklyn, N. Y., Atlantic Avenue R. R. Co.

Pres., H. M. Littell; Sec., William F. Ham.

Brooklyn, N. Y., Brooklyn City and Newtown R. R. Co.

Pres., John N. Partridge; Vice-Pres., Louis Fitzgerald; Sec. and Treas., Duncan B. Cannon; Supt., John L. Heins; Elec. and Mech. Eng., Howard A. Mock.

Brooklyn, N. Y., Brooklyn Heights R. R. Co.

Pres., Clinton L. Rossiter; Vice-Pres., Theodore F. Jackson; Sec. and Treas., Timothy S. Williams; Gen. Supt., Ira A. McCormack; Aud., Charles D. Meneely; Chief Eng., J. T. Whittlesey; Gen. Pass. Agent, H. Milton Kennedy.

Brooklyn, N. Y., Nassau Electric R. R. Co.

Pres., Albert L. Johnson; Vice-Pres. and Gen. Supt., Frank S. Drake; Sec., William F. Ham; Treas., Tom L. Johnson.

Buffalo, N. Y., Buffalo Traction Co.

Pres., Edwin G. S. Miller; Vice-Pres., Robert R. Hefford; Sec., Herbert P. Bissell; Treas. and Gen. Man., Joseph B. Mayer; Supt., George Chambers.

Buffalo, N. Y., Buffalo Ry. Co.

Pres., Henry M. Watson; Vice-Pres. and Gen. Man., Hardin H. Littell; Sec. and Treas., Joseph S. Baecher; Supt., P. C. Deming; Mast. Mech., Robert Dunning.

Butte, Montana, Butte Consolidated Ry. Co.

Pres., William A. Clark; Vice-Pres., William L. Hoge; Sec., Arthur H. Wathey; Treas., Alex. J. Johnston; Gen. Man., Jesse R. Wharton; Supt., Jesse S. Wathey; Elec., George Whitcomb.

Camden, N. J., Camden, Gloucester and Woodbury Ry. Co.

Pres., J. Willard Morgan; Sec., Thomas P. Curley; Treas., William J. Thompson; Supt., Justin Naramore; Elec. Supt., John McIsaacs; Elec., William Clyde.

Camden, N. J., Camden and Suburban Ry. Co.

Pres., William S. Scull; Vice-Pres., Benjamin C. Reeve; Sec., Morris W. Hall; Treas., Heulings Lippincott; Gen. Man., W. E. Harrington; Supt., F. A. Hewett.

Charleston, S. C., Charleston City Ry. Co.

Pres., J. A. McCullough; Sec. and Treas., F. D. McEwen; Gen. Supt., Theodore W. Passailaigue; Aud., Pinckney J. Balaguer; Elec., W. W. Fuller.

Chester, Pa., Chester Traction Co.

Pres., George B. Lindsay; Sec. and Treas., H. T. Walter; Gen. Man., John MacFayden; Elec., A. MacDowell.

Chicago, Ill., Calumet Electric St. Ry. Co.

Pres., John Farson; Sec. and Treas., H. B. White; Gen. Man., H. M. Sloan; Aud., J. J. Williams; Elec., W. A. Harding.

Chicago, Ill., Chicago City Ry. Co.

Pres., George H. Wheeler; 1st Vice-Pres., James C. King; 2d Vice-Pres., Erskine M. Phelps; Sec., Frank R. Greene; Treas., Thomas C. Penington; Aud., R. L. Garth; Gen. Man. and Supt., M. K. Bowen; Elec. Eng., George W. Knox.

Chicago, Ill., Cicero and Proviso St. Ry. Co.

Pres. and Gen. Man., John M. Roach; Vice-Pres. and Asst. Gen. Man., George A. Yuille; Sec., Henry G. Foreman; Treas., Louis S. Owsley.

Chicago, Ill., North Chicago St. R. R. Co.

Pres., Charles T. Yerkes; 1st Vice-Pres. and Aud., Warren F. Furbeck; 2d Vice-Pres. and Gen. Man., John M. Roach; Sec. and Treas., J. William Helm; Supt., T. A. Henderson; Asst. Supt., Harry Keegan; Elec., J. R. Chapman.

Chicago, Ill., West Chicago St. R. R. Co.

Pres., Charles T. Yerkes; 1st Vice-Pres. and Gen. Man., John M. Roach; 2d Vice-Pres. and Asst. Gen. Man., George A. Yuille; Sec. and Treas., Louis S. Owsley; Asst. Sec. and Treas, W. S. Bell; Elec., J. R. Chapman.

Cincinnati, O., Cincinnati Inclined Plane Ry. Co.

Pres., Hardin H. Littell; Vice-Pres., St. John Boyle; Sec., James M. Doherty; Gen. Man., H. P. Bradford.

Cincinnati, O., Cincinnati St. Ry. Co.

Pres. and Gen. Man., John Kilgour; Sec., James A. Collins; Treas., Robert A. Dunlap; Aud., William R. Avery; Gen. Supt., John Harris; Elec. Eng., Bayard L. Kilgour; Mech. Eng., Bert L. Baldwin; Eng. of Roadway, F. Reid Weizenecker; Pur. Agent, Alonzo G. Starr; Master Car Builder, Patrick Leen.

Cleveland, O., Akron, Bedford and Cleveland R. R. Co.

Pres., H. A. Everett; Vice-Pres., Will Christy; Sec., Fred. S. Barton; Treas., E. W. Moore; Supt., Frank J. Sloat; Elec., L. M. Sheldon.

Cleveland, O., Cleveland City Ry. Co.

Pres., Mark A. Hanna; Vice-Pres., C. F. Emery; Sec. and Treas., J. B. Hanna; Supt., George G. Mulhern.

Cleveland, O., Cleveland Electric Ry. Co.

Pres., Horace E. Andrews; Vice-Pres., James Parmelee; Sec., R. A. Harman; Treas., John F. Whitelaw; Man., John J. Stanley; Aud., William G. McDole; Elec., E. J. Cook.

Colorado Springs, Col., Colorado Springs Rapid Transit Ry. Co.

Pres., F. S. Martin; Vice-Pres., E. J. Eaton; Sec., Treas. and Gen. Man., A. L. Lawton; Supt. and Pur. Agent, D. L. Macaffree.

Columbus, O., Columbus St. Ry. Co.

Pres., Emerson McMillin; 1st Vice-Pres. and Treas., Edward K. Stewart; 2d Vice-Pres., Robert E. Sheldon; Sec. and Aud., Philander V. Burington; Gen. Supt., Willis F. Kelly; Elec., Michael S. Hopkins.

Council Bluffs, Ia., Omaha and Council Bluffs Ry. and Bridge Co.

Pres., N. W. Wells; Vice-Pres., J. J. Brown; Sec., C. T. Stewart; Treas., J. H. Millard; Gen. Supt., W. S. Dimmock; Elec., Israel Lovett; Mast. Mech., W. B. Tarkington.

Covington, Ky., South Covington and Cincinnati St. Ry. Co.

Pres., James C. Ernst; Vice-Pres., Charles E. Orr; Sec. and Treas., George M. Abbott; Gen. Supt., Thomas M. Jenkins.

Davenport, Ia., Tri-City Ry. Co.

Pres., E. E. Cook; Sec. and Treas., James F. Lardner; Gen. Supt., John G. Huntoon; Elec. Eng., John D. Fish; Chief Eng., Thomas Gowling.

Dayton, O., People's Ry. Co.

Pres., John A. McMahon; Vice-Pres., Ezra Bimm; Sec., Eugene Wuichet; Treas., Joseph W. Wayne; Gen. Man., George B. Kerper; Supt., Nelson Routzahn.

Denver, Col., Denver City R. R. Co.

Pres., George H. Holt; Vice-Pres., Joshua Wilbour; Sec. and Treas., G. D. L'huillier; Gen. Man., Edward C. Baggs; Eng., W. F. Smith.

Denver, Col., Denver Consolidated Tramway Co.

Pres., Rodney Curtis; Vice-Pres., William N. Byers; Sec., William G. Evans; Treas., G. E. Ross-Lewin; Aud., N. C. Jelliff; Gen. Supt., C. K. Durbin; Pur. Agent, C. F. Musgrove.

Derby, Conn., Derby Street Ry. Co.

Pres., H. Holton Wood; Vice-Pres., Charles F. Bliss; Sec. and Supt., B. W. Porter; Treas., Charles E. Clark; Asst. to Pres., William J. Clark.

Des Moines, Ia., Des Moines City Ry. Co.

Pres., J. S. Polk; Vice-Pres., George M. Hippee; Sec., A. G. Maish; Treas. and Gen. Man., George B. Hippee; Aud., J. H. Kern; Supt., W. G. Owens; Chief Eng. and Mast. Mech., J. S. Goodvell.

Detroit, Mich., Detroit Citizens' St. Ry. Co.

Pres., Tom L. Johnson; Vice-Pres. and Treas., Jere C. Hutchins; Sec., Albert E. Peters; Gen. Man., A. B. du Pont; Gen. Supt., John Grant; Aud., Irwin Fullerton; Supt. Power House, Thomas Farmer, Jr.; Track Supt., John Campbell; Supt. Line Work, Thomas Dunn.

Detroit, Mich., Fort Wayne and Belle Isle Ry. Co.

Pres., E. H. Butler; Vice-Pres., S. Schloss; Sec., Nathan W. Goodwin; Treas., Charles E. Kanter; Supt., George S. Hazard.

Detroit, Mich., Wyandotte and Detroit River Ry. Co.

Pres., Charles M. Swift; Sec. and Treas., Robert J. McKinney; Gen. Man., Strathearn Hendrie; Supt., John Busby.

Duluth, Minn., Duluth St. Ry. Co.

Pres., Luther Mendenhall; Vice-Pres., G. G. Hartley; Sec. and Treas., T. W. Hoopes; Gen. Man., Herbert Warren; Aud., Henry G. Cable; Eng., Mathew Noble.

Evansville, Ind., Evansville St. R. R. Co.

Pres., John J. Shipherd; Vice-Pres. and Gen. Man., H. D. Moran; Sec., E. W. Radder; Treas., Thomas S. Krutz; Elec. Eng., W. L. Stockton.

Fall River, Mass., Globe St. Ry. Co.

Pres. and Gen. Man., Robert S. Goff; Clerk, Marcus G. B. Swift; Treas., Herbert H. Reed; Gen. Supt., John H. Bowker; Elec. Eng., George W. Palmer, Jr.

Findlay, O., Findlay St. Ry. Co.

Pres., George B. Kerper; Vice-Pres., J. A. Bope; Sec., Jacob Strader; Treas., C. D. Kinney; Supt., Charles F. Smith; Elec., William Twining.

Galveston, Tex., Galveston City R. R. Co.

Pres., Julius Runge; Vice-Pres., A. G. Walker; Sec., A. Drauhlet; Treas., Joseph Lobit; Supt., J. K. Urie; Elec. Eng., Carl P. Young.

Girardville, Pa., Schuylkill Traction Co.

Pres., Dallas Sanders; Sec. and Treas., John A. Johann; Gen. Man., E. W. Ash.

Grand Rapids, Mich., Consolidated St. Ry. Co.

Pres., Gen. Man. and Pur. Agent, G. S. Johnson; Vice-Pres., V. Shaw Kennedy; Sec. and Treas., O. S. Gaither; Asst. Sec. and Treas., B. S. Hanchett, Jr.; Supt., D. Campbell; Elec. Eng., F. L. Stevenson.

Great Falls, Montana, Great Falls St. Ry. Co.

Pres., A. S. Bigelow; Vice-Pres., H. H. Stevens; Sec. and Treas., George L. Nelson; Supt., Wallace D. Dickinson.

Hamilton, Ont., Hamilton St. Ry. Co.

Pres., William Gibson; Vice-Pres., Edward Martin; Sec., Treas. and Gen. Man., Tunis B. Griffith; Elec. Eng., V. H. Waggoner.

Harrisburg, Pa., Harrisburg Traction Co.

Pres., E. C. Felton; Vice-Pres., B. F. Myers; Sec. and Treas., William J. Calder; Supt., Frank B. Musser.

Hartford, Conn., Hartford St. Ry. Co.

Pres., E. S. Goodrich; Vice-Pres., Samuel G. Dunham; Sec. and Treas., Daniel R. Howe; Gen. Man., Norman McD. Crawford; Aud., W. L. Robb.

Hazleton, Pa., Lehigh Traction Co.

Pres., C. W. Kline; Vice-Pres., John G. Saeger; Sec., E. S. Doud; Treas., N. C. Yost; Gen. Man., A. Markle; Supt., George W. Thompson; Elec. Eng., C. A. B. Houck.

Hoboken, N. J., North Hudson County Ry. Co.

Pres., Myles Tierney; Vice-Pres., E. A. Stevens; Sec., F. J. Mallory; Treas., Nicholas Goelz; Gen. Man., W. H. Starr; Aud., George T. Lister; Elec. Eng., A. K. Bonta.

Houston, Tex., Houston Electric St. Ry. Co.

Pres. and Treas., A. N. Parlin; Sec., H. C. Chase; Gen. Man., A. H. Hayward; Supt., Edward S. Ells; Aud., J. W. Payne.

Indianapolis, Ind., Citizens' St. R. R. Co.

Pres., Kennedy Crossan; Vice-Pres., W. W. Kurtz; Sec. and Treas., W. F. Milholland; Supt., Miller Elliott.

Jersey City, N. J., Consolidated Traction Co.

Pres., Edward F. C. Young; Vice-Pres., Elisha B. Gaddis; Sec., Thomas J. George; Treas., E. N. Hill; Gen. Man., David Young; Gen. Supt., Frank Ellmaker; Supts., H. W. Fuller, E. F. Hebard, George F. Chapman; Aud., E. D. Hibbs; Elec. Eng. and Pur. Agent, Gordon Campbell; Supt. of Line, George W. King.

Johnstown, Pa., Johnstown Passenger Ry. Co.

Pres., Tom L. Johnson; Vice-Pres., T. C. du Pont; Sec. and Gen. Man., S. E. Young; Treas., Herman Baumer; Elec. Eng., Charles J. Devine.

Kalamazoo, Mich., Michigan Traction Co.

Pres. and Gen. Man., Loren N. Downs; Vice-Pres., E. Hope Norton; Sec., Dee Allen; Treas., Charles A. Stover; Supts., F. I. Griswold and W. D. Hawley.

Kansas City, Mo., Metropolitan St. Ry. Co.

Pres. and Treas., C. F. Morse; Vice-Pres. and Gen. Man., W. H. Holmes; Sec., L. C. Krauthoff; Gen. Supt., C. F. Holmes; Aud., J. A. Harder; Elec. Supt., Charles Grover.

Lansing, Mich., Lansing City Elec. Ry. Co.

Pres. and Gen. Man., Loren N. Downs; Vice-Pres., James J. Baird; Sec. and Treas., Laurence Barrett; Supt., Homer A. Burton; Elec., Elmer Slaughter.

Lawrence, Mass., Lowell, Lawrence and Haverhill St. Ry. Co.

Pres. and Gen. Man., G. H. Campbell; Clerk, W. F. Pope; Treas., Charles A. Stone; Asst. Treas., W. A. Fisher; Aud., G. E. Tripp; Supts., N. E. Morton and F. Woodman.

Lexington, Ky., Belt Electric Line Co.

Pres. and Gen. Man., Charles H. Stoll; Vice-Pres., William J. Loughridge; Sec., Thomas D. Murray; Treas., Richard P. Stoll; Supt. and Elec., R. T. Gunn.

Lock Haven, Pa., Lock Haven Traction Co.

Pres., Charles A. Bragg; Vice-Pres., W. H. Mayer; Sec. and Gen. Man., Robert H. Irvine; Treas., George F. Porter; Elec., S. P. Rohe; Con. Elec., H. H. Harrison.

London, Ont., London St. Ry. Co.

Pres., Henry A. Everett; Vice-Pres., E. W. Moore; Sec., Treas. and Gen. Man., Charles E. A. Carr; Supt. and Chief Eng., S. Potter.

Long Island City, N. Y., New York & Queens County Ry. Co.

Pres., R. T. McCabe; Vice-Pres., E. J. Mathews; Sec. and Treas., Walter A. Pease; Gen. Man., George Chambers; Elec. Supt., W. E. Shephard.

Louisville, Ky., Louisville Ry. Co.

Pres., James B. Speed; Vice-Pres., St. John Boyle; Sec. and Treas., J. M. Pettus; Gen. Man., T. J. Minary; Gen. Supt., J. O. Haddox; Elec. Supt., W. C. Cook.

Lowell, Mass., Lowell and Suburban St. Ry. Co.

Pres., Edward M. Tucke; Vice-Pres., August Fels; Clerk and Gen. Man., P. F. Sullivan; Treas., Percy Parker; Aud., D. Dana Bartlett; Supt., P. T. Begley; Elec., Charles F. Bancroft.

Lynn, Mass., Lynn and Boston R. R. Co.

Pres., Amos F. Breed; Vice-Pres. and Clerk, E. Francis Oliver; Treas., Charles Williams; Gen. Man., Elwin C. Foster; Aud., Fred E. Smith; Elec. Eng., Maurice Hoopes; Supts., J. R. Carrier, H. C. Page, F. C. Wilkinson.

Manchester, N. H., Manchester St. Ry. Co.

Pres. and Gen. Man., Charles Williams; Clerk, Joseph W. Fellows; Treas., Charles H. Bartlett; Supt., N. H. Walker, Aud., George S. Chase; Pur. Agent, Arthur H. Williams; Elec. Eng., R. Jones; Civil Eng., T. Flynn.

Memphis, Tenn., Memphis St. Ry. Co.

Pres., C. K. G. Billings; Vice-Pres. and Gen. Man., F. G. Jones; Sec. and Treas., Robert L. Benson; Asst. Man., F. Smith; Elec. Supt., F. Thielengerdes.

Meriden, Conn., Meriden Elec. R. R. Co.

Pres. and Elec., N. H. Heft; Treas., W. L. Squire; Supt., W. P. Bristol.

Merrimac, Mass., Haverhill and Amesbury St. Ry. Co.

Pres., Charles Goss; Clerk and Treas., George A. Butman; Gen. Man., L. E. Lynde.

City of Mexico, So. America, Compania de Ferrocarriles del Distrito Federal de Mexico.

Pres. and Gen. Man., Thomas H. McLean; Sec., Thomas Moran; Treas., Francisco P. de Castillo; Asst. Gen. Man., D. F. Longstreet; Supt., Jose Rodriguez; Aud., George Beardsell; Elec., H. B. Niles.

Middletown, N. Y., Middletown-Goshen Traction Co.

Pres., James C. Hinchliffe; Vice-Pres. and Elec. Eng., M. J. Wightman; Sec., E. G. Wightman; Treas. and Gen. Man., W. B. Rockwell; Supt., Oscar C. G. Urban.

Milwaukee, Wis., Milwaukee Elec. Ry. and Light Co.

Pres., William Nelson Cromwell; Vice-Pres., Henry C. Payne; Sec., Charles A. Spofford; Treas., Edward Edes; Gen. Man., John I. Beggs; Gen. Supt., T. E. Mitten; Aud., William L. Mason; Elec., O. M. Rau; Supt. of Con., A. W. Lynn.

Minneapolis, Minn., Twin City Rapid Transit Co.

Pres., Thomas Lowry; Vice-Pres., Sec. and Treas., Calvin G. Goodrich; Gen. Man., Willard J. Hield; Aud., John F. Calderwood; Supt., Gus. Brigger; Pur. Agent, A. M. Baldwin.

Mobile, Ala., Mobile Light and R. R. Co.

Pres. and Gen. Man., J. H. Wilson; Sec., C. W. Chase; Supt., J. E. Fincher; Elec. Eng., S. M. Coffin: Chief Eng., J. A. Maloney.

Mobile, Ala., Mobile Street R. R. Co.

Pres., J. C. Morris; Vice-Pres., F. J. Gasquet; Sec., R. B. Owen, Jr.; Treas. and Gen. Man., Raphael Semmes; Aud., Peter Stark; Elec. and Mech. Eng., J. F. McAviney.

Nashville, Tenn., Nashville St. Ry.

Pres., Thomas M. Steger; Vice-Pres., L. D. Tyson; Sec. and Treas., Nathan P. Yeatman; Gen. Man., Edward G. Connette; Mast. Mech., George Swint.

Newark, N. J., Newark and South Orange Ry. Co.

Pres., Gottfried Krueger; Vice-Pres. and Treas., William Scheerer; Sec., Robertson S. Ward; Gen. Man., Andrew Radell; Supt., James McDonough; Aud., George W. Roe; Elec. Eng., D. J. McGregor.

New Bedford, Mass., Union St. Ry. Co.

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NIAGARA FALLS, 1897.